Standardization

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Special Issue
Company Member
Conference

Why Standards for Ball, Roller Bearings? (page 220)
Company Member Conference . . . (pages 204–219)

• JULY 1951

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Company Members—More than 2000 companies hold membership either directly or by group arrangement through their respective trade associations.

Marginal Notes

"In Recognition of Outstanding Service . . ."—

It is only right and proper that the many hours of time and effort given by individual representatives of trade associations, technical societies, and companies in the service of coordinated national standards receive some fitting recognition. Last month, members of the Board of Directors and the Standards Council received such recognition in the form of certificates awarded by the American Standards Association, in recognition of their contributions to standardization as a means of strengthening the American economy.

"The reservoir of American standards available to industry and the mobilization agencies of the government have helped to grease the wheels of all-out production in time of crisis," T. D. Jolly, president of ASA, pointed out in presenting the awards to the Board members (see picture page 229). The ceremony took place at the annual President's Luncheon at The Waldorf-Astoria, New York, May 28.

In presenting the awards to members of the Standards Council at the Council meeting May 29, Vice-Admiral G. F. Hussey, Jr, managing director of ASA, commented on the changing role and increased importance of the Council in the promulgation of American Standards. "Through representation on the Council, Member-Bodies—technical societies, trade associations, and consumer groups—continue to control the policies under which ASA's activities are conducted," he said. "The delegation of administrative details formerly handled by the Council to subordinate groups has left the Council free to give greater consideration to policy questions concerning ASA's program as it affects consumer production and mobilization requirements."

Standards Council members who received the awards typify the wide

range of interests among the organizations taking part in the coordination of standards on a nation-wide scale. Members and the organizations they repreesnt are: W. Vernon Brumbaugh, Refrigeration Equipment Manufacturers Association; George P. Byrne, Industry Service Bureaus; Dr Thomas H. Chilton, American Institute of Chemical Engineers; Karl L. Ghaster, Jr, Outdoor Advertising Association of America; Neal D. Howard, Association of American Railways; W. F. Kelley, Motion Picture Research Council, Inc; Alton G. Knight, National Machine Tool Builders Association; Harry B. Lindsay, Grinding Wheel Institute; H. E. Newell, Fire Protection Group; Carlton H. Rose, American Society for Testing Materials; R. E. Shull, National Office Management Association; H. O. Smith, The Anti-Friction Bearing Manufacturers Association, Inc; Clarence H. Waring, American Gas Association; C. E. Wilson, Air Conditioning & Refrigerating Machinery Association; Lloyd H. Yeager, Gypsum Association.

Our Front Cover

The rollers on our cover are some of the largest made. The gloved hand on page 220 shows the various parts of one of the smaller types of ball bearings. Large or small, roller or ball, bearings can conform to standard specifications for the greatest benefit to the majority of bearing users and manufacturers.

Why Standards for Ball and Roller Bearings? is discussed fully and intelligently by Mr V. L. Barr, Director of Engineering at the Roller Bearing Company of America. Mr Barr is also chairman of ASA Sectional Committee on B3 on Ball and Roller Bearings. Long interested in standards for ball and roller bearings, Mr Barr breaks down usage into nine phases. Of these, one was completed last year; another this year, and a third is now being developed.

Opinions expressed by authors in STANDARDIZATION *are not necessarily those of the American Standards Association.*

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Standardization is dynamic, not static. It means not to stand still, but to move forward together.

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ASA

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Left to right:—Vice Admiral E. D. Foster (RCA); Vice Admiral G. F. Hussey, Jr (ASA); L. A. Danse (General Motors Corp); Colonel A. E. Mickelsen (Munitions Board Standards Agency)

Left to right:—R. L. Thomas (ASME Minnesota Chapter); J. G. Henderson (Carbide & Carbon Chemicals Co); Vice Admiral E. D. Foster; H. H. Loeffler (Exeter Paper Co)

With the Minnesota Section of the American Society of Mechanical Engineers acting as sponsor, the meeting of the Company Member Conference at Minneapolis-St. Paul May 22 brought company representatives from ten states in the Middle West and from others as far east as Vermont, Delaware, and New York.

"Creeping mobilization," coordination of military standards, problems of packaging, and the chemical industry's approach to standards were subjects of the papers presented. (For these papers, see pages 205-219.)

Lively discussions centered around such questions as how savings from standards can be determined; how to gear industry's standards (particularly drawing practices) with those of the government; and why special requirements may be needed for military equipment.

Professor Lee S. Whitson, University of Minnesota, chairman of the ASME Minnesota Section, and Robert L. Thomas, Minneapolis-Moline Company, had charge of local arrangements.

Company Member Conference Officers—A. J. Beck (Detroit Edison Co), Vice-Chairman; W. P. Kliment (Crane Co), Chairman

CMC's Administrative Committee:—S. H. Watson (RCA); R. A. Miller (Pittsburgh Plate Glass Co); W. P. Kliment (Crane Co); L. M. Dalcher (Fairbanks-Morse & Co); B. H. Jorgenson (Tennessee-Eastman Corp); A. J. Beck (Detroit Edison Co)

What "Creeping Mobilization" Means to Industry

by Vice Admiral E. D. Foster (SC) (USN, ret)

Admiral Foster became Director of Mobilization Planning for the Radio Corporation of America when he retired from the Navy after some 34 years of service.

During the war he was successively Supply Officer in Charge of Aviation Supply Depot and Assistant Chief of the Bureau of Supplies and Accounts. After the war he was Chief of the Bureau of Supplies and Accounts and then Chief of Naval Material, Navy Department.

As he himself says, "Most of my almost 34 years of service were devoted to playing a small part, not only in supplying what the operational forces of the Navy required, but in trying to see that the proper items, without unnecessary duplication, were supplied."

On this objective, operating personnel, engineers, and supply technicians worked hand in hand and made considerable progress, Admiral Foster comments. He cites as an example the fact that during World War II, the number of Aviation Engine Spare Parts, carried to support one engine manufacturer's products, was reduced from 20,000 to 4,200, and the number of items of structural aviation spare parts sent to the Pacific was reduced by 48 percent with no impairment of effective support.

"In fact," Admiral Foster comments, "we even carried the torch back to the producer. We found that one fighter airplane manufacturer used over 400 bolts in the construction of his plane, whereas another manufacturer of a similar type of fighter used but 40. When brought to the attention of the former, he soon reduced his to 40, and each adopted as his standard the A-N standards then stocked throughout our supply structure."

INDUSTRIAL Mobilization Planning can broadly be defined as the joint effort of industry and of Government to insure the best utilization of our industrial might. Standardization is one of the prosaic but potent tools that must be progressively used to that end. The Department of Defense has recognized the importance of material standardization as a part of mobilization planning, and has set up, within the Munitions Board, an agency for this specific purpose (see "The Standards Agency for the Armed Forces," page 000). The extent to which an intelligent standardization program can increase the utilization of material and thereby increase our combat potential is astounding.

It is my firm belief that conscientious joint industrial mobilization planning is indispensable for the assurance of integrated strength adequate to preserve our national security. Our experience in the two world wars has proved the vital necessity of such planning. On each occasion, we were given two years of grace in which to tool up for war—an opportunity we most likely will never again be permitted—while our allies took the brunt of the initial attack. Even then, it took us many months to develop the support required for a successful war effort. In the meantime, the enemy made sweeping advances over territory which it took us years to regain—at unconscionable cost, in terms both of resources and lives. It is just as important to avoid "too little too late" in terms of industrial support as it is in terms of fighting forces.

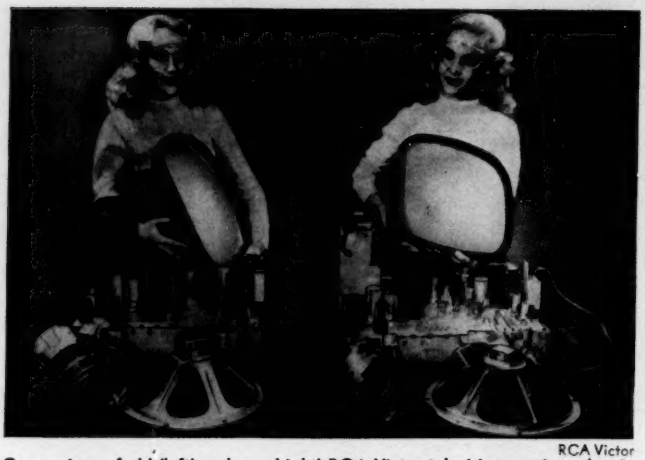
Although our fighting forces should be maintained in sufficient strength to preclude any sane thoughts of military action against us, it is axiomatic that our national economy cannot and should not be expected, in peacetime, to support the fighting potential required in time of war. It is, likewise, axiomatic that we cannot expect industrial facilities, geared to the production of goods for the peacetime economy, to be converted overnight to the production of enormous quantities of munitions of war. Nevertheless, if costly lessons of the past are to be heeded, we are faced with the stark necessity of curtailing to the irreducible minimum the time required for such conversion.

Facilities and equipment must be available, and harnessed, ready to go, to produce items not now manufactured at all or manufactured in insufficient quantities. The best technical know-how must be developed, in the most efficient manner and in the minimum of time, to produce predetermined quantities of these munitions. And specific plants must be assigned the responsibility for specific wartime production, and equipped with precise knowledge of conversion requirements. These are the prime military objectives of Industrial Mobilization Planning.

At the same time, provision must be made for the continued support of our civilian economy, since without this support, no military effort can be sustained. It is the job and the duty of both Government and industry to work together to preserve an optimum balance between these dual objectives.

Basic to all of this effort is determination of requirements. Requirements can be determined only if we have a plan of operations. Our defense plans, of course, are made by our Joint Chiefs of Staff to meet the requirements of the international situation as evaluated by the National Security Council, which comprises, as you know, the President, the Vice

NOTE: The views expressed here are those of the author and do not necessarily reflect the views of the Navy Department.



RCA Victor

Comparison of old (left) and new (right) RCA Victor television receiver chassis shows design changes which nearly eliminate use of top-critical cobalt and reduce amounts of strategic metals employed. Note absence of focus magnet.

President, the Secretaries of State and of Defense, and the Chairman of the National Security Resources Board. In addition, the President may appoint to membership of the National Security Council by and with the consent of the Senate, the Secretaries and Under Secretaries of other Executive Departments and Military Departments, the Chairman of the Munitions Board, and Chairman of the Research and Development Board.

Following is an explanation, in skeletonized form, of the tie-in between our Industrial Mobilization Planning and this basic operational plan or plans. The J.C.S. plan is turned over to the operational heads of the three departments, i.e., the Army, Navy and Air Force. Here are developed, conforming to the J.C.S. plans, operational plans for each fighting service. From these operational plans, supporting logistical plans are developed, which in turn are translated into overall material requirements. These are submitted to the Munitions Board, then recapitulated and determination made as to whether material and facilities will be available to support the operations planned. The inadequacies revealed by this feasibility test are then either provided for by such measures as stockpiling or acceptable substitutions, or steps are taken, through the reverse of the channels I have described, to have the basic operational plan adjusted to the degree it can be logistically supported. The Mobilization plan is a part of the logistical supporting structure, and it is this that is translated into the end material requirements which comprise industry's basis for industrial mobilization planning.

We all appreciate fully how difficult is our task of developing effective wartime plans for maximum utilization of our industrial potential. The character of this whole program—including the basic and supporting plans, and the requirements that stem from these—is one of constant change and adjustment. On the one hand, the basic operational plan must be geared to changes in the international situation. On the other hand, technological progress has added and is still adding further complexity to the solution of our logistical problems. It was not so many years ago that armies subsisted on their bellies; that Navies could replenish their supplies at almost any port of call, if necessary by plunder; and that air forces were unheard of. Technological evolution has changed all of this. Our fighting machine has now become a mechanical and electronics colossus with a seemingly insatiable appetite, requiring a constant stream of an unbelievable number of supplies, flowing from all parts of our country, and in many instances from remote parts of the world.

The magnitude of the problem is indicated by the number of items required. The Navy alone requires almost three million items. The Army and Air Force require many of them and still other items peculiar to their needs, which likely add a couple of million more. Most of these items must be immediately available when and where required. Consider the helplessness of the most modern air group, completely manned with the finest and best trained personnel and thoroughly equipped in every respect, except that it has no fuel, or no tires for its landing gear, or even no valves for the tires.

The development of our fighting machine into an infinitely complex structure has been paralleled by the rise in importance of speed in putting our fighting machine into operation. The pace has been accelerated in every way. The measure of distances, for example, in terms of travel time, has been progressively reduced, because of technological and scientific advances, from years to months, to days, to hours, and in some cases even to minutes. Areas formerly considered impregnable because of their geographical isolation have now become vulnerable.

New Hard-Headed Planning

So much for the character, the magnitude, the complexity and the scope of our industrial mobilization planning job. The job here to be done is essential if we are to give the fighting machine sufficient support to assure preservation of our American way of life. It will require all of the hard-headed planning we can evolve for the harnessing, in all-out war, of our industrial potential.

The Munitions Board Industrial Mobilization Planning Program embraces war procurement, war distribution, economic warfare and demobilization. It is obvious that industry's participation in this program is concerned largely with war procurement, and the production which makes procurement possible. Excellent progress in this field has been made. Many plants have been con-

tacted and surveyed by Department of Defense representatives and determination made with Management of what munition requirements their plants, with a minimum of facility and lay-out change, can be converted to produce—with sizeable capacity still left for civilian economy production. Contracts have been made in many instances for completion by management of detailed conversion plans for an all-out war. Tentative agreements have been made by Management with the Army, Navy and Air Force for management so to convert when properly notified and then to start specified munitions production. In some instances subcontractors have even been tentatively picked, and in others, prototype production run contracts for the items allocated have been awarded and actual production experience obtained.

Much more ingenuity, at least on the part of industry, is required for the solution of the industrial mobilization planning task with which we are currently confronted. Although our industrial mobilization planning for all-out war is far from being perfected, we at least can make definitive plans for a fairly predictable situation. We know that we shall make the maximum logistical effort to support the military — consistent with that which is required for essential needs of the civilian economy. The emphasis may change operationally, as it did in World War II, from one theatre to another (Europe to the Pacific), or from one weapon to another (tank to landing craft), but the industrial effort is pretty well defined, both in scope and character. We know that we can depend upon full controls being imposed and accepted, by industry, by labor, by Congress and by the people.

The situation today is entirely different. It can best be illustrated by a comparison with conditions prevailing during World War II. The objective of industrial mobilization then was total victory over the Axis powers; today our aim is to avoid war by restoring and maintaining a balance of military power. The effort then was all-out and relatively brief;

RCA Victor

The new light-weight walkie-talkie (right) is contrasted with its counterpart of World War II (left). Major General S. B. Aikin and Walter A. Buck, Vice-President and General Manager of RCA Victor test the equipment.

the effort now is partial and likely to last for a long time. We then took about 45 percent of the country's production for the support of the war effort; we now are taking about 10 percent, with an anticipated peak of 20 percent. We then accelerated as fast as possible, and as much as possible, a wholesale shift from production of civilian goods to that of wartime munitions; today we are trying to shift to an "on guard" position which will still permit a large amount of civilian production—which will increase after the military requirements have reached their "creeping mobilization" peak and after the military power balance is achieved. We entered World War II with nearly six million unemployed, and about ⅓ of our productive resources unused; we entered the current emergency with virtually no involuntary unemployment and our productive facilities operating at near capacity. We then were deeply aware of the fact that we were fighting for survival, and all hands were willing to make any sacrifice to participate actively in support of the war effort; today, despite the realities of Korea, the mood is sometimes sober, sometimes cynical, sometimes gay, and front-page headlines emphasize the personal aspects of General MacArthur's dismissal, the Kefauver crime investigation and the cutback in meat prices.

All of this highlights the fact that even a brink-of-war economic policy is far different from that upon which we can plan with reasonable certainty for an all-out effort. In these days of creeping mobilization, we just don't know the extent or kind of war, limited or otherwise that we may be called upon to support. We cannot look to Government for the positive guidance during creeping mobilization which it can give us for all-out mobilization. Accordingly, industry must initiate its own plans for meeting the innumerable unpredictable contingencies which we now face.

This involves maintenance of that fineness of balance between military and civilian production which will afford the military the support it requires, and still not weaken the civilian economy to a point where it cannot continuously sustain effective support of the military. Following are the more important factors we in industry must now analyze and evaluate if we are to make the decisions which will attain this objective.

Availability of Materials:

What will be the effect of restrictions imposed by the Government, either voluntarily or involuntarily, upon the importation of basic materials? What will be the effect of the price and wage controls, of manpower controls, of restrictions upon inventories, of the use in production of

basic materials, and of allocations and priorities. What changes are likely to be made in these controls, and what would be the effect of such changes?

Civilian Consumer Demand:

Civilian consumer demand for one's product must be considered in the evaluation of almost any commercial or industrial problem. At this time, it must be considered in the light of various abnormal factors and conditions. For example, what will be the effect upon consumer product demand of the increases in taxes that have been imposed; what additional taxes may we anticipate; when will they be made effective; and what will be their effect upon demand for our products? How will the continuing rise in living cost affect the consumer market, particularly the marginal buyer, and what will be the psychological effect of substitution of materials in the manufacture of products, particularly if the potential customer assumes, even wrongly, that such substitution will adversely affect quality of the product? What will be the customer's reaction to any potential product shortages he may assume will exist? Will resulting buying cause peaks and valleys in demand? What war scares will develop and what will be their effect on consumer demand? What additional credit Controls will be imposed and what will be their effect?

Military Requirements:

Essential to determination of probable availability of materials for production are, of course, reliable estimates of what will be the character, scope, and magnitude of the abnormal military requirements. The uncertainty of operational needs, due to changes in strategic factors and technological advances, make impossible an exact determination of military requirements. The nature of equipment needs depends in large measure on the kind of action on which plans are concentrated—for example, whether on land, on the sea, or in the air.

Congressional Appropriations:

How much the armed services buy is limited by the amount of money Congress appropriates for defense. We know that the attitude of Congress or of the Administration, or of both, has changed from one of a comparative "free-reign" to one of "let's have a good look-see."

What effect will this have upon next year's defense appropriations? Will Congress repeat its practice of the last two years in deferring action for two months after expiration of the fiscal year?

Contrary to what many business men have assumed, "creeping mobilization" does not call for Government procurement of the type or magnitude of that of World War II.

In terms of 1951 dollars, the highest World War II annual expenditure for defense aggregated 130 billion dollars, and the highest annual peak rate was $145 billion. Today our spending for defense approximates only a 20 billion dollar annual rate, which will reach a 30 billion dollar annual rate by 1 July of this year. As I shall later point out, expenditures will increase, but as stated by President Truman, in his budget message, our military and security programs "are estimated to require about 20 percent of our national output by the end of fiscal year 1952 (June 30, 1952), and this is substantially less than the 45 percent of total output which was going to security purposes at the peak of World War II. But it will involve a rapid and substantial shift of resources."

Time Lag:

Another most important factor for our evaluation is the time lag between the time funds are appropriated and the time they are expended for the products manufactured. Two phases of this lag require consideration. The first is the long period it takes to prepare specifications, and the second is the time involved in reducing the overall specifications to blueprint form and in tooling up for production. Remember that most of these items are new, or at least improved versions of what has been used heretofore. This is both logical and mandatory. We cannot freeze design in the military field for a protracted period. If we do, we will suffer defeat through a "Maginot Line" philosophy of defense. And it does take time to engineer new designs. We can, however, standardize on much of the material that goes into these equipments and we must ever be alert to change standards so as not to hinder evolutionary improvements.

In any event, these essential time lags must be anticipated—by all concerned. Otherwise, there is danger of a serious production vacuum between the time normal commercial production is cut back and military production picks up. The effects of such a vacuum are all too well known in terms of unemployment, recessions and depressions. Of special concern, too, is the risk of dissipating technical know-how at the very time when it should be developed and increased. This we find particularly true in the electronics industry, where a much greater than average increase in productive effort will soon be demanded because of the tremendous increase in military electronics requirements.

Aluminum Co of America

Pouring aluminum pig at a reduction plant. The flow of these ingots to consumer products is diminishing rapidly.

Government Procurement Procedures:

Because the necessary conversion of facilities is costly, care must be taken to see that the interest of both the Government and industry are protected in negotiation, redetermination, and renegotiation. This calls for special attention to changes in current procurement. Since the beginning of the Korean effort, negotiation has been used more and more in the award of Government contracts. When, last December, the President declared a National Emergency, the awarding of military contracts by negotiation rather than after formal advertised bid requests greatly facilitated military procurement. Army, Navy and Air Force Procurement offices were authorized to dispense with formal bidding procedures to the degree necessary to prevent production delay. The exercise of this authority has improved the coordination of current procurement with all-out mobilization plans under the production allocation program. But many problems remain. How, for example, can industry satisfactorily meet the Services' request for tooling up for all-out mobilization for a specific item on the basis of a firm order for a small quantity only with no guarantee of later orders, either large or small?

How can we, in seeking and accepting Government defense contracts, choose the items that will enable us to contribute our full share to the defense effort and still not burden our companies with unrecoverable reconversion costs. After all, reconversion costs are on the whole unrecoverable, and in the main, we can make intelligent analyses and evaluations, when we undertake specific types of Government work, of what these reconversion costs will be. And, remember that our national strength is but a composite of the industrial segments which make up the whole.

Small Business:

Small business is an integral essential part of our economic system. As such, small business quite properly participates in military procurement along with larger firms. Quite properly also, and quite logically, small business receives a large share of the procurement dollar—defense and civilian—at the subcontract level. By way of illustration, the vendors and suppliers from whom the RCA Victor Division made purchases in 1949 numbered some 4800, being located in 41 states. Of the total number, 79 percent has less than 500 employees and 49 percent has less than 100 employees. The vendors and suppliers having less than 500 employees received about 45 percent of our total dollar purchases.

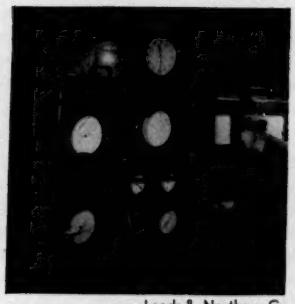
In an analysis of one of our Government contracts, we found that of 119 vendors and subcontractors, 73 percent were firms with less than 500 employees, and that these firms received 45 percent of the total volume of our purchases. These percentages, it is noted, were consistent with our overall figures.

I believe it to be the responsibility both of Government and of industry to recognize the indispensable role of small business, and to see to it that small business is provided its full share of Government orders. On the other hand, it should be recognized that small business and big business are mutually inter-dependent. Small business cannot, generally speaking, maintain the engineering organizations so necessary for the research and development of the constantly changing and very

complex equipments demanded by our fighting forces. In many instances small business, unless it in fact becomes big business, cannot undertake the production of the major fighting units. Neither their facilities nor their technical staffs would be adequate for this purpose. On the other hand, small business can and should be given subcontracts to produce many of the major and minor assemblies that comprise the complete units.

What has to me proved astounding is the fact that neither Government nor industry has collected statistics to ascertain just how much of the whole is thus subcontracted to small business. RCA has proved that these statistics are easily assembled, and, I repeat for sake of emphasis, that small business receives from RCA almost half of what we subcontract. This assumes real significance when one considers that about 60 percent of the cost of our product is subcontracted.

In short, I am stressing my conviction that all that is needed to clarify the small business problem is for those of us in industry to get up off our sternsheets and collect data we have at our fingertips, summarize this very real story, and present it for all to see.



Leeds & Northrup Co

Research is underway to add another instrument to open hearth furnace panels . . . to measure air temperatures.

Conservation:

It is perfectly obvious that any saving of critical materials redounds not only to the benefit of the company making the saving but also to that of industry and of the nation. Here again, industry must take the initiative. For example, nickel, as I mentioned before, is short. The electronics industry realized this and by acceptable substitution has saved 30 percent of the nickel formerly required for electronic tube production. Even greater savings have been realized in the use of cobalt in electronics production. Our Company has been a leader in the conservative use of critical materials. We must all continue to work out our own solutions to our own problems and submit them as our contribution to the current emergency. If we don't, we shall very likely have solutions imposed upon us which will not serve the best interests, either of industry or of Government.

Standards currently specified for electronic tubes illustrate that which I here have in mind. MIL specifications for electronic tubes are extremely tight. It is natural that the Services should want the highest degree of reliability built in the tubes they need for their modern equipments. Some of these tight specs are a must if the proper functioning of the equipment is to be assured, for example, aboard a B-29. On the other hand, production of the ruggedized tubes with a premium on high reliability involves very high percentages of scrapping and loss in overall production, and the Services have found that unnecessary insistence upon production of these premium tubes results in there not being enough to go around. Upon proper presentation, justifiable relaxation in tightness of specs is attainable. By way of illustration, we are currently asking the Navy to consider our request to conserve nickel by substituting nickel-plated tube leads which we have found satisfactory, for solid nickel leads they currently prescribe.

Initiation by industry of conservation measures, such as these, stretch and expand the utilizing of scarce materials, facilitate the meeting of production schedules and increase our combat potential. And, incidentally, this illustration highlights and emphasizes the complementary roles of conservation, standardization and industrial mobilization planning, in utilizing to the hilt the resources with which we are blessed. There is no excuse for not developing to the fullest our industrial potential, that which is the envy of those who might seek to destroy us, and which has been termed by so many our "secret weapon."

To illustrate how those of us in Industrial Mobilization Planning must analyze and use these factors in advising top management of what this creeping mobilization portends: We know that there has been appropriated this fiscal year for the defense departments about 48.2 billion dollars. The President has asked that the Congress appropriate for the Defense Departments 60.7 billion for the fiscal year 1952. The total available and expected to be made available for this two year period thus totals about 108.9 billion dollars. But—it is forecast that of these appropriations only a total of 58.9 billion dollars will actually be expended (19.4 in fiscal 1951 and 39.5 in fiscal 1952). Thus, we will start fiscal 1953 (July 1, 1952) with a backlog of about 50 billion dollars, most all of which is for procurement —and this figure excludes from consideration funds which will specifically be appropriated for fiscal 1953. To measure the abnormal impact upon our economy of this 50 billion dollar backlog, we, of course, must delete the normal carry-over of about 9 billion dollars, and make

Copper & Brass Research Assn

Copper, being mined by the Anaconda Copper Mining Co in one of the few underground copper pits, is one of the critical items.

allowances for the decrease of about 2 billion dollars for estimated reduction in national stockpiling demands. After these and other adjustments have been made, we shall still have an abnormal backlog of hard goods procurement of well over 36 billion dollars, which represents an increase of over 30 percent above our normal hard goods production.

This is understandable. Our industrial defense effort has assumed great magnitude overnight. We started this fiscal year with defense appropriations of 12 billion dollars. This year's defense appropriations now aggregate 48.2 billions. It takes time to translate appropriations into production. Our defense hard goods spending rate was 400 million dollars per month pre-Korea; by June of 1951 it will have increased three times. If this rate of acceleration of expenditures continues—and it very well could if the program currently projected is carried out—monthly hard goods expenditures for defense might approximate $3 billion before the end of fiscal year 1952—and it is at that time that we shall have this approximate 36 billion dollars of abnormal hard goods backlog as a substantial base for a still further increase in the defense spending rate.

Substantial aid in taking up the slack to counter-balance this backlog can come only from increased production—and here the emphasis is on materials. Money is artificial, shrinking and variable, and it is the materials that count—what we really live for. Supply of materials is not

very flexible, and changes in the flow of materials are brought about slowly. There now exists a shortage in the supply of basic materials, but I believe it is apparent from what I have already stated that the drain on materials has thus far been easy, and that unless production output is greatly increased, increasing tightness in the supply of materials will pose a much more serious problem for industry, particularly that part engaged in other than defense or defense supporting production.

What can we hope for in the way of an increased supply of materials to counter-balance the accelerating impact of this abnormal increase in hard goods demand attributable to defense? Perhaps the best quick indicators are the basic materials chosen to make operative our CMP —Aluminum, Copper and Steel. Just yesterday we were told that for the next quarter the uses of aluminum would be again curtailed this time to 50 percent of the base period; of copper to 60 percent; and of steel to 70 percent. Producers of these materials have just been told that the Government "take" for copper in its various forms, for the third quarter of this year—compulsory acceptance by purchase of D.O. orders—will be increased to percentages approximating 75 percent. Approximately the same required percentage of "take" is forecast for steel.

So far as I can gather, aluminum, though tight now, will not be the bottleneck. Demand next year is forecast to be 20 percent higher than now (1,425,000 tons) with supply adequate.

Copper presents quite a different picture. Anticipated withdrawals of about 2,480,000 tons won't satisfy demand. Inventories are shrinking. Some relief, the extent of which is known only to the Department of Defense, can be realized if national stockpiling is suspended. We can get additional relief if we pay higher prices for imports. The President today signed a bill to suspend 2 cents per lb. duty on copper, until 15 February 1953 or until the end of the present emergency, whichever is earlier. Chile has already been authorized to charge us 3 cents per lb. above the currently established prices. But, nonavailability of an adequate supply of copper will limit production, and the same can be said of cobalt, nickel, zinc, molybdenum and tungsten.

Steel, perhaps, might better be taken as a measure of our ability to meet this $35 to $40 billion increase of abnormal hard goods demand which it appears will be carried forward into fiscal 1953 (July 1, 1952). Here we can expect some relief. Before Korea, our annual capacity approximated 90 million tons. Current plans call for this capacity to be expanded to 117 million tons—but it has already been expanded to 105 million tons. Thus, two years from now we can expect a 11.4 percent increase in steel production as contrasted to the estimate above described in abnormal defense requirements of over 30 percent. It has already been predicted that steel available for civilian use, other than for defense purposes, will by June of 1952 be 15 percent less than is now available.

There are, of course, mitigating factors which might very well lessen this impact. For example, improved techniques may bring about increases in steel production, without further increase in facilities. "Necessity is always the Mother of Invention!" It is stated by John S. Marsh, research engineer of Bethlehem Steel, that research work utilizing a new device for measuring air temperatures in steel furnaces has led to the conclusion that the industry may be able to obtain a tremendous increase in output through steps cutting down on air leakage in open hearth equipment. Mr Marsh claims that an additional increase of two tons per hour in the production of an open hearth furnace can be obtained by raising air temperatures within the furnace by 10 percent. It is claimed that further increases in steel output can be realized by reducing silica content.

On the other hand, the figures I have cited as a result of the analysis I have summarized are quite conservative. Defense demand for industrial production, for which, of course, steel is mandatory, will be considerably greater than I have indicated. The estimates of impact I have given you include only those requirements for our own fighting services. They do not include the aid we have given and plan to give allied nations, either in arms or in other production which will help them prepare to defend themselves—nor do the figures I have given you include national stockpiling, civilian defense requirements, or the abnormal increases for such supplemental agencies as the Coast Guard. These additional defense requirements are by no means insignificant. I have not yet had time to estimate them accurately, but in final analysis of what figures I now have, there appear to be sums aggregating a minimum of 18 billion dollars, appropriated or requested for this purpose, for fiscal '51 and '52. I see by the news just released that the President has announced he is about to ask for 8.5 billion dollars for "mutual security." (I believe these foreign aid funds are included in the 18 billion I have just mentioned.) There have already been appropriated over 8 billion dollars for stockpiling and the President has announced he is about to ask for an additional $800,000,000 for this purpose.

At any rate, it is clear that materials available for civilian production, i.e. other than those for defense or defense supporting purposes, will be progressively curtailed, and the curtailment will be greater if defense appropriations for fiscal 1953 are as great or greater than those now budgeted for 1952. But remember—this is not all-out war to be finished in a relatively short time. This brink-of-war status may continue to obtain for a protracted period. If so, the civilian economy, as I have stressed before, must continue to be sustained, or it in turn can't continue to sustain even creeping mobilization. If the international picture does not take a turn for the worse, is it not possible that some war production will be shoved further forward in the future and thus

(*Continued on page* 230)

The Standards Agency for the Armed Forces

by Colonel A. E. Mickelsen

Director, Munitions Board, Standards Agency

THE size of the military procurement load placed upon the productive capacity of the country during World War II very quickly demonstrated the need for standardization. To meet this need, the Joint Army and Navy Specifications Board was established in 1943. This Board developed what are known as the JAN specifications. These were specifications covering items in common use between both the Army and Navy. By 1948 the Board had produced 565 specifications and 5 standards. Standardization, as you well know, is slow, and most of these specifications were developed too late to be of effective use in World War II production. All subsequent studies of the war productive effort emphasized the need for standardization.

With the organization of the Department of Defense under the National Security Act of 1947 and the 1949 Amendments, the responsibility for the standardization of specifications and of common use items was placed on the Munitions Board. Without going into detail it must be realized that there is also responsibility for standardization placed in the Joint Chiefs of Staff and the Research and Development Board. The Munitions Board responsibility for standardization is in the procurement-production phase, subsequent to the research and development phase.

The Munitions Board in its organization places the responsibility for standardization under the Directorate of Supply Management. The Munitions Board Standards Agency was established on the 11th of May 1948 as a successor body to the Joint Army and Navy Specifications Board. It comes under the supervision of Mr McBrian, the Vice Chairman of the Munitions Board for Supply Management, and Admiral Ring, the Military Director for Supply Management.

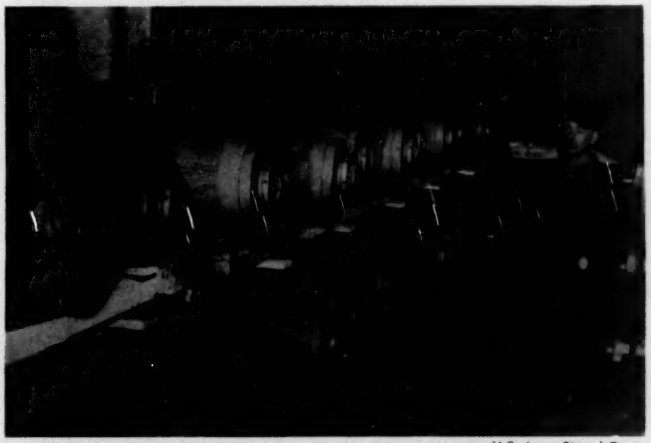
The new Agency was faced with a problem of establishing policies and procedure to accomplish its mission. While continuing the projects already established by the Joint Army and Navy Specifications Board, it proceeded with the task of preparing procedural manuals that would be acceptable to the three Military Departments. The first of these, the manual for specifications, was approved in June of 1949, and the others for standards, equipment standardization, and qualified products lists followed in 1949 and 1950.

Effective 1 March 1950, all specifications produced in the Department of Defense had to be MIL specifications, the successor symbol to JAN. All procurement is in order of preference by Federal, MIL, or Departmental specifications. No date for conversion of Departmental specifications was determined until May 1951. The plan now is to complete this large job of conversion by July 1955.

This chronological summary shows how the job of standardization was fitted into a going concern without undue interference of procurement or of loss of continuity of effort. It also shows how young in the field of standardization the Standards Agency really is, a fact that is not appreciated by those unaccustomed to the time-consuming character of all standardization attempts.

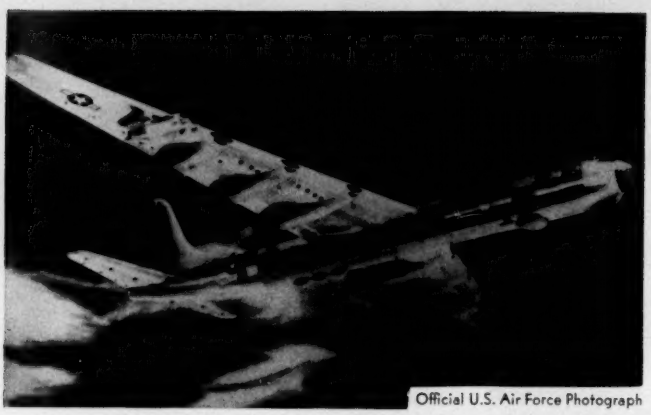
In considering Military specifications, it must be remembered that they are customer or consumer specifications, and when adopted they are, like Federal specifications, mandatory for use by the Military Departments. The Standards Agency provides for the avoidance of duplication both in the Military series and between the Military and Federal series. Being mandatory for use, it is vitally important that the principle of adoption by consensus be followed. Each Military Department has a logistical responsibility for the supply of equipment of a quality and quantity it has determined necessary for its forces. This ever present fact makes it easy to see why agreement on some specifications and standards is not easy to obtain.

The procedure for the development of specifications is a decentralized



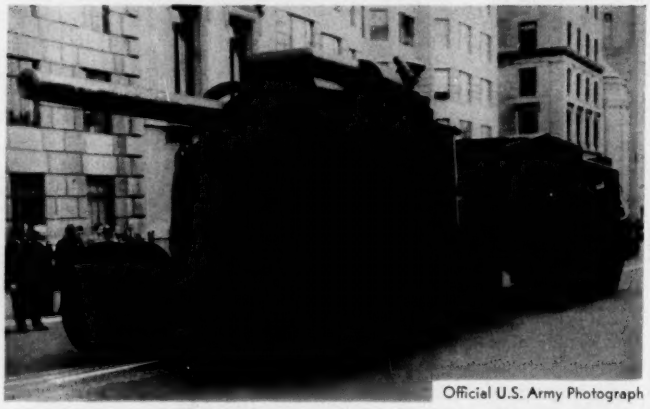
U.S. Army Signal Corps

Stacked in a railroad freight car are 500-pound demolition bombs ready to leave a plant in Philadelphia Ordnance District area for an Ordnance Department loading area.



Official U.S. Air Force Photograph

Such masterpieces of precision as the Air Force's B36, above, the Army's 90 MM Anti Aircraft gun and the Navy's renowned battleship "Missouri"



Official U.S. Army Photograph

require not only careful planning and production, but extremely precise specifications to begin with . . . equally important—standard specifications.

Official U.S. Navy Photograph

one. A project is established by the Standards Agency, usually at the suggestion of an interested activity. The project is checked for duplication and need. If initiation is approved, a technical service, bureau, or the Air Materiel Command is designated to develop the specification. The Standards Agency determines and informs the preparing activity of interest. Progress is monitored by the Standards Agency. The preparing activity attempts to reconcile all comments and finally submits the specification to the Standards Agency for editing, approval, and issuance. Any unreconciled comments are, if necessary, reconciled by the Standards Agency by use of unification meetings. At the Standards Agency the acceptance by the three departments is indicated by the Departmental Representatives who, with the Chief of the Agency, form the Executive Group of the Standards Agency.

Each specification and standard has a custodian or custodians designated who are responsible for maintenance of the specification or standard in a current condition.

To provide for immediate procurement, when time does not permit coordination, the Departments may issue MIL-uncoordinated specifications which are subsequently processed as fully coordinated specifications. These have the same symbol and format, but carry the label of the issuing activity in parentheses as a suffix to the MIL symbol. They do not have the preamble indicating acceptance by the three Military Departments. New procedures under consideration, it is hoped, will speed up the transition from the MIL-uncoordinated stage to the fully coordinated stage.

Standards follow somewhat the same procedure, though they are developed to a large extent by task groups of experts designated by the Military Departments. There are two forms of MIL standards—the book form and sheet form. The sheet form is quite new in use and in many respects is a drawing depicting standardized items rather than a word description.

Standardization is, of course, accomplished in detail by the adoption

of specifications and standards agreed to by the three Military Departments. However, as is so often the case when a job is accomplished in detail, the result when viewed as a whole shows that much improvement could be obtained. This is where the equipment standardization manual of procedures comes into play. A standardization study project is initiated and a selected task group or, in some cases, a selected activity is given a particular problem to study. For example, a standardization study was set up for lubrication fittings and the group of experts studied all the existent specifications for this category, and the requirements of the services. The group then made recommendations as to what should be done in the way of establishing standards and eliminating or modifying existent specifications in order to achieve the maximum benefits of standardization in this particular category. Upon approval at the Standards Agency of the results of such a study, steps are taken to provide for the development, approval, revision, etc, of the specifications and standards needed to reap the benefits of the study. About 88 such studies are in progress at the present time.

It will be noted that the actual de-

(*Continued on page* 230)

Military Index Available

THREE volumes of the Military Index of specifications and standards used by the Services for procurement are now available. Volume I is just off the press. Known as the Index of Military Specifications and Standards, it lists the MIL and JAN specifications and standards that have been adopted for use by all three military services—Army, Navy, and Air Force.

In addition to this general index, each Service publishes a list of the specifications and standards it uses for procurement. The Index of Specifications and Standards Used by the Department of the Navy, Military Index Volume III, and the Index of Specifications and Related Publications (Used by) the U. S. Air Force, Military Index Volume IV, have already been published. The volume published by the Army (Volume II) is still in process but copies are expected early in July.

Each volume is to be published semi-annually. In the interim, cumulative monthly supplements will keep them up to date. Copies can be obtained from the Government Printing Office, Washington 25, D. C. The supplement service is included in the price—$2.75 for each semi-annual volume.

Copies of the standards and specifications listed in the indexes can be obtained from the Services specifically concerned. The Service that acts as custodian is listed following the title and number of each specification in the general Index of Military Specifications and Standards, Volume I.

Procedures are provided whereby products needed quickly by one of the Services can be procured without waiting for coordination of the specification with all the other Services. In this case, the specification is issued as an MIL uncoordinated specification, and is so identified through the use of the initials of the issuing Service immediately following the identifying number. An aerial delivery kit, for example, is identified as MIL-A-5919 (USAF). To make it a full-fledged MIL coordinated specification, it will be circulated to all the Services to determine whether they have an interest in it. If interested, they will either accept it as prepared and clear it for release as an MIL specification, or offer suggestions for including material needed for their special use. Whether interested or not, they have the responsibility of clearing it with the Standards Agency.

A number of special groups who have worked in particular fields for many years have been brought into the system established by the Standards Agency. One of these is the Standards Group that specializes in aeronautical equipment. Another is the Petroleum Committee of the Munitions Board. A third is the Quartermaster's Food and Container Institute of the Armed Forces in Chicago which works on standards for subsistence items. The work on electrical components done through the Armed Services Electro-Standards Agency at Fort Monmouth, New Jersey, is also coordinated through the Munitions Board Standards Agency.

The Agency also has liaison with a number of the committees working on American Standards—such as the committee on drawings and drafting standards, for example. As drafts of the revised edition now under way are completed, they are sent to the Agency for comment. An agreement has been worked out on abbreviations for use on drawings, and welding symbols and definitions used by the Agency are uniform with the American Standard, to mention a couple of examples.

Four branches of the Agency work on specific phases of standardization:—Materials Branch (includes metals; petroleum; rubber; plastic; chemical warfare items; chemicals; construction materials); General Commodities Branch (includes civil engineering; water craft; general engineering standards; textiles; medical supplies; and laboratory equipment; packing and packaging; hardware); Electrical Branch (includes electronic equipment; electronic components; electrical power equipment); and Mechanical Branch (includes machinery; power and hand tools; ordnance and aircraft material; construction and land transportation equipment; photographic, mapping, and similar equipment).

Military Packaging Is Big Business

by H. H. Loeffler

Mr Loeffler, president of the Exeter Paper Company, Chicago, had experience with packaging of military supplies as a Supply Corps Officer during World War II. He is contributing to the solution of packaging standardization problems as chairman of the Packaging Advisory Committee, National Security Industrial Association; chairman of the Planning Committee of the Munitions Board Packaging Industry Advisory Committee; and chairman of the Armed Force Packaging Committee of the Society of Packaging and Materials Handling Engineers.

The economic importance of the millions of dollars spent for packaging military supplies is far beyond the actual money spent, Mr Loeffler commented during conversations at the Company Member Conference, May 22, where this paper was presented. "On certain small spare parts, the cost of adequate protective packaging may be several times the cost of the product itself," he said. "However, the dollar value of an item in the United States may be no indication of its value in a theatre of military operations. There, a missing $5.00 part may incapacitate a $50,000 unit." Changing strategic requirements are the cause of continuous studies being given to development of packaging materials. These are needed because of the variety of climatic conditions under which the military may have to operate, he explained.

IF we are going to spend from 40 to 50 billion dollars in fiscal 1952 on military expenditures, past performance tells us that packaging will take something in excess of three billion dollars out of the total. Packaging in the military falls under the heading of military material logistics —the preparation of material for shipment. It covers cleaning and corrosion prevention, wrapping, interior and exterior containers, cushioning and bracing to protect material against damage from shock, shipping containers, identification and, under certain circumstances, palletizing, carloading, and bracing.

What we are trying to accomplish is to continuously reduce the terrific losses experienced in the past, particularly in the early stages of World War II, which were occasioned by faulty or insufficient preservation and packaging.

People keep telling us how simple our problem is. After all, all you have to do is wrap up the stuff carefully in such a way that no matter where it goes it will get there safely. Of course the trouble starts when we go into the *how* of doing it. That is when it becomes apparent that practically everyone considers himself a packaging expert. It is amazing how many different solutions to the same problem you can reach when you figure that there are qualified people in each of the seven bureaus of the Navy, in the technical services of the Army, and in the Air Force Commands who are working on this very same or a similar problem. Many of these answers are quite correct, but the result is the opposite of standardization.

Consequently, during World War II there were times when we had five or six different preservation and packaging lines in a plant for the same spare part, simply because everyone could agree on the engineering details of the unit itself, but the packaging experts, fancied or real, in each department, all had their own solution on how to wrap it up. In general, industry expressed its willingness to go along on any method of packaging for a given item provided the Services could just get together on one specific one. Gradually the need for uniformity was recognized, but at the same time it was apparent that such coordination could only come about through a process of evolution, particularly in view of the conditions that prevailed at that time. As a result, in 1944 the Navy Packaging Board and the Army Packaging Board were established; and, since it has become a separate entity, the Air Force also has established a Packaging Board. These Boards were able to create a certain amount of uniformity within each branch of the Department of Defense.

Whenever a problem was common to more than one service, a joint packaging specification was written and we still think that the development of JPI's—Joint Packaging Instructions—was the biggest step forward in the right direction. Finally, the Munitions Board Joint Packaging Committee was created, where the chairmen of the three Packaging Boards had weekly conferences to try to find a common denominator for mutual or controversial problems. In August 1950 the Munitions Board Joint Packaging Committee was discontinued. Some of us thought this was a step backward because it took away the common conference table where these things could be ironed out. However, the committee was replaced by the Munitions Board Packaging Division. This is a staff agency under Colonel Way, where all packaging problems today are to be coordinated. After a difficult beginning, considerable progress has been made.

One of the biggest accomplishments will be the Military Packaging Manual which is now in the process of being completed. It is based on the

Packaging Manual developed by the Bureau of Aeronautics in the Navy and adopted for general use by all Military Departments.

Authority Backs Uniformity

Nevertheless, coordination does not necessarily mean standardization and uniformity unless certain technical authority accompanies it. The Munitions Board Packaging Industry Advisory Committee, in order to stop the trend towards diversification and away from standardization has recently submitted a proposal divorcing the flow lines of technical responsibility from command lines, in order to be sure that if, for instance, two field activities of the Department of Ordnance in the Army have the same packaging problem their instructions to industry will be for the same Method; if two technical services in the Army have the same problem, clearance with the Army Packaging Board will insure the same packaging instructions to industry. Where the Army and Navy or Air Force have a common problem, it will be cleared through a top-side staff agency, such as the Munitions Board Packaging Division, in order to do away with contradictory instructions and specifications.

Of course on paper we have exactly that type of organization now. The Munitions Board Packaging Division is today the coordinating facility for all packaging activities within the military, just as the Army Packaging Board is the coordinating facility for all packaging within the Army, the Navy Packaging Board for the Navy, etc. Experience has shown, however, that we need strengthening of this structure; we need some teeth in it if we want it to work efficiently.

These suggested changes in the organizational structure are mentioned to indicate that a great deal of thought is continuously given towards further improvement in a situation which is immeasurably better than it was some years ago. For example, general agreement has been reached that whichever service has the largest dollar interest in the plant should decide the packaging method and the other services will agree to accept their spare parts, or whatever it may be, from the same plant processed and packaged in the same way. This is expected to accomplish preservation and packaging uniformity, at least plant-wise—to do away with the five or six preservation and packaging lines we had in some instances in World War II.

In the technical committees of the National Security Industrial Association—for example, in our Packaging Advisory Committee and the Materials Handling Advisory Committee—continuing studies are going on towards further standardization. In the last couple of months, I appointed a task committee in the Packaging Advisory Committee of NSIA to make a study of moisture-vapor barrier material as covered by the new specification MIL-B-131 which used to be JAN-P-131. This specification has been a problem child for many years. The difficulties are due to an honest difference of opinion between various equally qualified people. As a result of this disagreement, however, some would specify MIL-B-131 and others ANB-20. These differ only in very minor details, but there really seemed no basic justification for two valid specifications for potentially the same material. The catalyst for the sudden appointment of this task committee was the fact that the textile industry (the most troublesome grade is basically a barrier of foil and plastic backed with sorim) told us that they would never guarantee supplying us with a material which would meet the specification requirements. The first meeting resulted in a 200-page transcript, but gradually we feel we are narrowing it down to a workable compromise.

So far I have referred primarily to standardization of Methods. Another factor continuously cropping up is standardization of numbers—standardization of units in a package. Every step towards standardization in that respect will reduce costs at the manufacturing end as well as for the military, where it will simplify cataloging, requisitioning, inventory and stock control, etc. Necessarily the military must always base their unit package specification on the ultimate unit of issue or, in other cases, the number required to overhaul. The next consideration is the number making an efficient package, or a number based on a unit of ten.

Again, uniformity for the entire Department of Defense sounds much simpler than it is. So many of the highly technical gadgets the military needs these days are so far beyond my ken that I like to stick to something simple, like nuts and bolts, or

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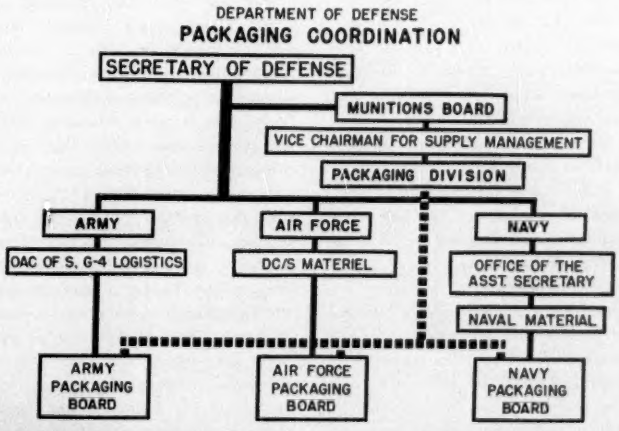


How the Military Services organize their work on packaging: Each branch has a packaging board that works with the Packaging Division of the Munitions Board.

Standards for the Chemical Industry

by J. G. Henderson

Mr Henderson is with the Carbide and Carbon Chemicals Company, a Division of Union Carbide and Carbon Corporation, and is chairman of the Chemical Industry Correlating Committee.

THE chemical industry is a large and important consumer of constructional materials and the principal industrial goods of America. It, therefore, provides a fertile field for national standardization, not only in the mutual interests of independent chemical companies and their suppliers but, because of volume consumed, in the broader interests of the national economy. On a national basis, nonproduct standardization—that is, standardization of the things the industry buys for the construction, operation, and maintenance of its production facilities—is a virgin field, substantially untouched. For somehow, somewhere along the road in its phenomenal development in becoming one of America's great industries, the chemical industry appeared to assume a peculiar — unconventional — almost disdainful attitude toward industry-wide standardization. It apparently wanted no part of it.

If standards are good for other industries, why not the chemical industry? Is not standardization an element of basic economy? If so, how could such success come to any industry that flouts basic economic laws? You have asked yourself these questions many times, I am sure. But have you answered them to your own satisfaction?

If you are a producer of iron, steel, or nonferrous mill products; if you are a foundryman, or a fabricator of mechanical equipment; if you are a manufacturer in the metal trades; if you make control instruments, mechanical or electrical apparatus; or, indeed, if your business or professional interests are in any way associated with the chemical industry, directly or indirectly, then you probably have been much concerned, and doubtless have been critical of the industry's apparent reluctance to enter into mutual standardization programs. And in doing so you were justified, for you, too, have an important stake in standards for the chemical industry.

Let us crystallize and refine the issue. Let us achieve an understanding of the underlying, fundamental reasons for the chemical industry's attitude toward standardization, and what can be done about it. Such an understanding, I am sure, will help all of us get together and, to our mutual advantage, do the big job that lies ahead. To do this, I believe it necessary to outline but three distinct characteristics of the industry. Individually, the effects of these are important — collectively, they are profound.

(1) In many respects the chemical industry is quite unlike any other basic industry. With respect to variety of products it is perhaps the broadest and most comprehensive industry. Its products range into the tens of thousands, with an almost limitless future horizon—from fertilizers to perfumes and cosmetics, from slow-burning domestic fuels and common explosives to the incredible atomic bomb, from cements and adhesives to the modern plastics—inks, dyes, paints, coatings, solvents, textiles, lubricants, pharmaceutical products, and so on, through an amazingly long list of products that are increasingly raising our standard of living. Most of these are wrested from the basic raw materials of nature—the minerals that nature has so generously bestowed upon us—these, in combination with such common and inexhaustible commodities as air and water, are the bulk of the raw materials with which the chemical industry is supplied.

In the processing of these raw materials to form the myriad of intermediate or finished products of the chemical industry, almost every known scientific principle has been utilized, and almost every conceivable technique has been employed. Various processes are carried out under pressures and at temperatures that represent the commercial extremes. The insidious effects of corrosion are a constant problem. The development of constructional materials to resist the destructive influences of pressure, temperature, and corrosion has proved a constant challenge to the technical ingenuity of the industry.

Just why the chemical industry's broad range of processes would affect the degree of standardization, or the lack of it, best can be understood by citing a few typical examples.

The highest commercial pressures are reported to be in the range of 30,000 pounds. There are a number of commercial installations using pressures in excess of 5,000 pounds. Their designs and the materials used in their construction are highly special, and it appears that they will remain so for some time. Their cost doubtless always will be so high as to reduce to relative insignificance the margin of advantage that otherwise might result from standardization.

Often processes are so critical that for their success the production units must be built to extremely rigid specifications. Metals of high purity, alloys compounded within very narrow limits and treated by highly special techniques, and special fabrication procedures, all are common requirements—common in a sense only that they occur frequently, and not in the sense of being the same.

In fact, technical personnel responsible for design and procurement have become accustomed to modifying material specifications that are thoroughly accepted standards in other industries. Here, modification might be termed "standard practice." In some cases, indeed, it may have become a habit.

(2) Survival of independent chemical companies depends largely upon advantages held through technological developments. This is the nature of the industry. There follows, then, a natural reticence toward a free interchange of information in the development of their new processes. In important developments, all phases of the process frequently become closely guarded secrets. There is a reluctance to divulging, for example, the materials of construction, the operating pressures and temperatures, or the operating efficiency of the production unit.

The core of the industry's economic structure is its stock and trade in technological advancement. The industry spends vast sums of money in experimental and research projects. It employs large segments of the world's scientific and technical personnel. Through them it is constantly searching for new products, for methods of improving existing products, and for making them cheaper. If independent chemical companies fail to progress technologically, then surely they will risk failure financially.

In view of such important investments, then, is it not proper and logical that confidential information that may have accrued to the advantage of independent chemical companies be zealously guarded? Cases have existed where company policies have tended to discourage the participation of its personnel in industry-wide standardization projects, because of a feeling that commitments in information necessary to the project might be detrimental to the best interests of the company. If the value of proprietary rights far exceeds any possible advantages that might be gained by standardization, would not the proprietor be justified in retaining these rights unto himself? Wouldn't you? Otherwise, why make the investment? Why not let your competitor do it?

Installing an exchanger tube bundle, which removes propane from crude petroleum, after it has been cleaned and inspected. This operation is but one of the many that turn a natural mineral into the variety of products used in everyday life.

M. W. Kellogg Co

(3) Compared to other large industries, the modern chemical industry is in its infancy, but none-the-less a giant. Born in the United States during World War I, it has suffered growing pains. It has had little time to pause for a second breath, during which time it might have taken stock of those many small economic refinements that are the life-blood of older industries. So rapid was the chemical industry's development, that by comparison these refinements were relatively insignificant. Other industries have developed along more traditional lines. Their economic positions rose and fell with the national and international tides. But not so with the chemical industry. Possibly due to relief from production demands, great technological advancement was achieved even during periods of general economic distress. During the economic depression years of the early and middle thirties, for example, there was nurtured from the laboratory and small-scale production units the vast modern plastics industry as we know it today. Synthetic rubber, synthetic textile fibers, and a long list of important synthetic organic chemicals received great development impetus during this period.

In its production units for these new processes, many of which have since become commonplace, the chemical industry has taken advantage, to a considerable extent, of existing American Standards and other industrial standards. If such standards positively were applicable, as indeed they were in many cases, then their application obviously was justified. But whenever some question arose regarding the advisability of their application—and there were many such questions—then, due to the urgency of the project, it seemed expedient to negotiate for nonstandard commodities, based upon specially prepared specifications, devoid of any encumbrances whatsoever.

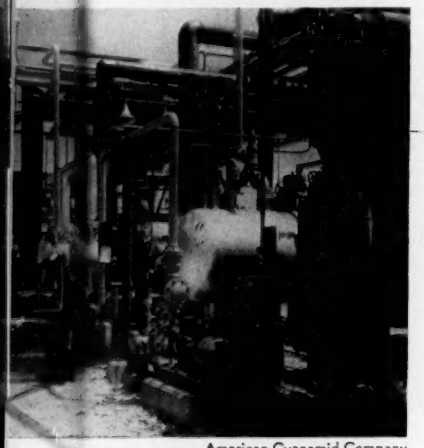
In getting new process units into operation for large-scale production, speed is essential. Before the investment in actual construction is made, it is, of course, logical to assume that successful research and development work has been concluded, that production costs have been determined, and that the market has been evaluated. Frequently, contracts for sale and delivery of the product have been negotiated, with costly penalties conditioned upon not only the quality of the product, but also the quantities and the start of delivery. Failure to meet these commitments can be disastrous; consistent fulfillment always is a major factor in the success of any independent chemical company.

The use of applicable industrial standards frequently is of great value in bringing these units into production on schedule, and to this extent they are fully utilized. If, however, questions arise regarding their proper application, then circumstances dictate they not be used.

The American Standards Association, industry's own clearinghouse for standards, quite naturally points

to the benefits of sound standardization. But they caution that premature standardization is harmful; that it can hamstring development work by freezing design prematurely. Too much standardization can seriously retard technological advances. Compulsory standards are not beneficial.

Thus it can be seen that the chemical industry, in certain important respects, cannot be compared with other large industries. First, it encompasses a field of products that perhaps is more diversified than that of any other industry; second, the proprietary rights of independent companies, as represented by technical knowledge, processes or methods of manufacture, and equipment design, frequently are bought and paid for by expenditures of huge sums of money; and, finally, its youth and phenomenal growth have promoted certain abnormalities, giving rise to an apparent indifference to industry-wide standardization and the economic benefits that result from it.



American Cyanamid Company

Exterior chemical operation illustrating variety of materials, equipment, and fabrication methods involved.

Among these characteristics we have seen the underlying reasons for the chemical industry's apparent reluctance to enter into broad standardization, on a national basis. Circumstances that are born of these characteristics are many and varied, and it has been shown that they do have a profound effect in shaping the industry's attitude toward national standardization.

Now, having acknowledged what seems to be an aversion toward broad standardization on the part of the chemical industry, and having explored the fundamental reasons for this, the next steps are to determine what can be done about it, and what is being done about it.

Conditions Ripe for Standards

We know that the most fertile fields for standardization lie in those areas where there exists large-scale, repetitious demand. Standardization, therefore, is most effective in industries where, to an important degree, these elements have become stabilized. When various companies or agencies independently develop demands for the same or even nearly the same material or commodity, or when the quality or the service characteristics become noticeably similar, or when other patterns of similarity develop, then it is likely that standardization of that material or that commodity is overdue. When these agencies or companies independently and consistently make exceptions of the same character to existing standards, then modifications or additions to those standards are indicated. In the chemical industry, in spite of the many special conditions that have retarded standardization, there now appear cases where there has developed large-scale, repetitious demand.

There has been a definite, but understandable feeling that the burden of standardization should rest with the supplier. In the development of standards, it would seem of prime importance that the supplier do all that is reasonably possible to determine and meet the requirements of the consumer. In past attempts to initiate standardization projects for the consuming chemical industry, this viewpoint has proved an important deterrent.

Factually, the manufacturers who supply the chemical industry have been thoroughly cognizant of the needs of separate companies and, therefore, were in a position to note important differences in the specifications issued by these companies, which specifications perhaps were intended to meet identical requirements. This situation repeatedly has been brought to the attention of independent chemical companies, for only they were in a position to consolidate their demands. Independent chemical companies, however, had little experience in teaming-up in such matters. In fact there did not exist any effective machinery through which this necessary cooperative action might be attained.

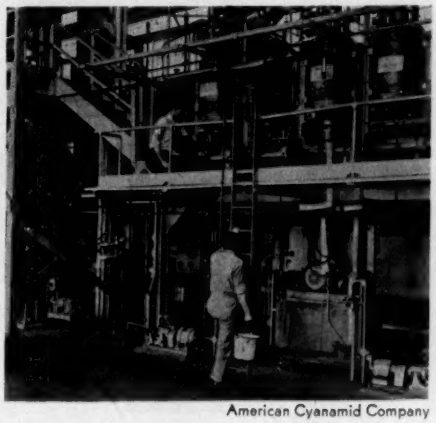
Although there had developed substantial requirements for standardization in certain specific fields, there remained the traditional reluctance of independent chemical companies to participate with their competitors in general standardization projects, lest their respective production advantages be dissipated. It seemed logical, therefore, first to shear off a segment of the whole standardization problem, and include in that segment only the type of needed projects having the least possibility of policy-wise opposition—projects concerning procurement items, those things which the industry buys for the construction, operation, and maintenance of its production facilities. Further, it seemed a job that should be undertaken by both supplier and consumer.

Meeting on Light-Weight Pipe

In the fall of 1949, a small group of representatives of chemical companies and pressure tubing manufacturers met informally in New York to explore the possibilities of establishing a standard for light weight stainless steel pipe. There was a continuing substantial demand for this class of pipe, yet no two chemical companies were in agreement on purchase specifications. All were using their individual company standards that had been developed independently. Manufacturers had sought a reconciliation of these various requirements, but had been unsuccessful.

The group attained complete agreement, with amazing ease and dispatch. A standard had been agreed upon but now there had arisen the problem of what to do

with it. The informal group, having no official standing, could neither publish it nor sponsor it as an American Standard. It was immediately recognized that there was great need for a formal committee having official backing of the chemical industry, and the support and cooperation of the industry's suppliers—a committee that could correlate the views of the entire chemical industry, crystallize these views into needed standardization projects, and steer these projects over their proper courses to final acceptance as industry-wide standards.



Small-scale chemical plant houses operation showing multiplicity of pressure vessels, pumps, dryers, service lines, and operating panel boards.

American Cyanamid Company

Various succeeding conferences, proposals, and negotiations led to the formal request of the Manufacturing Chemists' Association to the American Standards Association for the organization of a Chemical Industry Correlating Committee. Included in the request was a limitation upon the proposed committee's scope, whereby its activities were to be limited to needed standardization in the field of procurement items—the things that the industry buys—and thereby excluding product standardization. Accordingly, on May 5, 1950, the ASA Chemical Industry Correlating Committee formally came into being. Participating trade associations and technical societies naming committeemen are American Institute of Chemical Engineers, American Petroleum Institute, American Society of Mechanical Engineers, American Society for Testing Materials, Compressed Gas Association, Manufacturing Chemists' Association, and Synthetic Organic Chemical Manufacturers Association.

In passing, it is interesting to observe that the first project of the CICC was promotion of the stainless steel pipe standard that had been informally proposed a year and a half previously. This standard now has become widely accepted, and presently is being processed as American Standard, ASA B36.19, Schedule 5S.

Other CICC projects in various stages of development, are:

- Corrosion-resistant flanged valves, flanges, and flanged fittings.
- Chemical industry recommendations for clarification of ASME Boiler Code, Unfired Pressure Vessels Section.
- Valves and fittings for use with liquids and gases under pressure, such as sulphur dioxide, chlorine, and ammonia.
- Stainless steel analyses.
- Storage and handling of anhydrous ammonia and ammonia solutions.
- Code for pressure piping.
- Clarification and designation of surface qualities of finished mill products.

There are other projects under consideration by the CICC, and doubtless there will be many more. The committee is concerned, however, with following the logical course of doing first things first. This will entail the selection and development of standardization projects for which there is a definite and urgent need—those that will serve, mutually, broad sections of the chemical industry and its suppliers. Since the scope of activities of the CICC includes mainly the standardization of constructional materials and procurement items, it follows that its success largely can be measured by the degree of cooperation attained not only between the various chemical companies, their trade associations, and technical societies, but also the producers, manufacturers, fabricators, or other suppliers. The procedures necessary to effect this cooperation are ideally suited to the procedures of the American Standards Association, under which the CICC operates.

Let us summarize, briefly. There exists in the chemical industry an extremely large, almost virgin field for effective industry-wide and national standardization. Due to certain characteristics of the industry—notably its youth, its immensity and diversification of processes and products, and the fully-justified desire of independent companies to protect their proprietary rights—these characteristics, singly and in combination, have tended to retard industry-wide standardization. Analysis disclosed the existence of a large segment of potential standardization projects—needed, important projects, in the field of procurement items—those things the industry buys for the construction, operation, and maintenance of its production facilities. Lying between the extremes of service requirements—that is, not the highest nor the lowest service temperatures, and within the range of common commercial pressures—there exists the bulk of materials and commodities of which the chemical industry is a major consumer.

Effective standardization in this broad area can be carried forward, and the results will be of great benefit to the chemical industry, to its suppliers, and to the national economy. The industry-backed Chemical Industry Correlating Committee of the American Standards Association has been organized to engineer the job. Continued support by the chemical industry, plus some sharp thinking and hard work on the part of its engineering personnel, and anticipated cooperation from materials and equipment manufacturers, will, I am sure, bring amazing results.

Why Standards for Ball and Roller Bearings?

by V. L. Barr

Mr Barr is Director of Engineering, Roller Bearing Company of America and chairman of the Sectional Committee on Ball and Roller Bearings, B3.

THE 200-inch telescope on Mt Palomar uses a total of 5600 ball and roller bearings. Some large aircraft use over 3100 ball and roller bearings per ship. Each automobile has over 25 anti-friction bearings. Practically every piece of mechanical equipment in every industry—such as, agriculture, machine tools, textile, construction, transportation, materials handling, home appliances, etc—uses ball and roller bearings. When one's attention is focused on such facts it is readily understood why the Anti-Friction Bearing industry produces over 250 million bearings per year of over 18,000 various types and sizes.

This wide variety of types and sizes is a measure of the vast progress that has been made in all kinds of machinery. This has led to a demand for bearings of greater capacity and of lighter construction; bearings to operate at higher speeds; bearings of extremely low friction and noise; sealed bearings, and many other requirements. Such progress is to be encouraged; but, when procurement is jeopardized because of some slight revision to bearings that would otherwise be standard, attention should be paid to the possibility of using a standard product.

Considering the wide ramifications of the bearing industry as indicated above, one can readily appreciate the uncountable, recurring difficulties that arise in such phases of bearing usage as: (a) Terminology; (b) Boundary Dimensions; (c) Tolerances; (d) Gaging; (e) Coding; (f) Packaging; (g) Mounting Practice; (h) Mounting Accessories; and (i) Capacity or rating.

The solution to such recurring difficulties is a national standard, made workable by the voluntary agreement of producer and user through the agency of the American Standards Association (ASA). The voluntary agreement means some sacrifice on the part of producer and user alike, and many sacrifices have been made to date in providing the standards that have already been set up. Many more sacrifices must be made, and individual company pride must be set aside if satisfactory standardization is to be accomplished.

Early last year, the first phase of this important standardization program was completed in the issuance of the American Standard on Gaging Practice for Ball and Roller Bearings, B3.4-1950, described in STANDARDIZATION, page 39, February 1950. This standard specifies the acceptable methods of measuring the various dimensions of ball and roller bearings, which heretofore had been a serious problem because of the relatively thin sections and small tolerances met in certain types and sizes of bearings.

At this writing, two more phases of this complex problem are being solved. The proposed American Standard Terminology and Definitions, B3.7, has been approved by the sponsor and is about to be submitted to ASA for approval; and the American Standard Tolerances for Ball and Roller Bearings, B3.5-1951, has already been approved by the ASA and has just been published.[1]

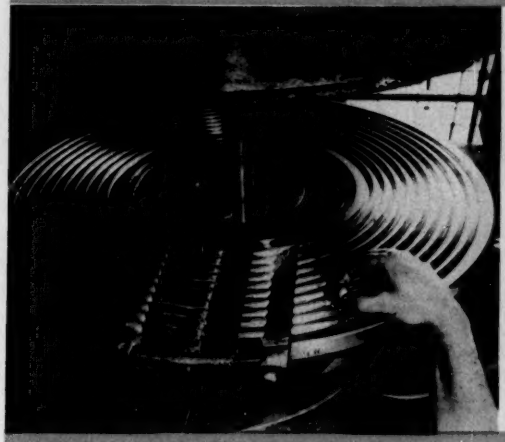
The standardization of Terminology and Definitions spans a long-lived gap, not only between manufacturer and user, but between manufacturers themselves and within the organization of any one company.

Since the beginning of the bearing industry, many names have been used synonymously, such as "ring," and "race"; "cup" and "cone"; and "separator," "cage," and "retainer." These have been derived from the individual manufacturer's shop parlance, and the meaning of the various terms is well understood within the industry; but their multiplicity has often left the bearing user confused. An example of what may ultimately be avoided by standardized

[1] Copies can be obtained from the American Standards Association at 75 cents each.

The first operation in making balls for ball bearings is cold heading of balls. Steel wire is fed into the machine to be cut and pressed.

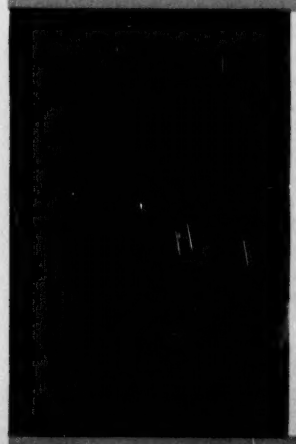
One of the final operations in processing balls for bearings is entirely mechanical. This operation is called multiple-groove precision grinding.



Here is the surface of one of the disks which do the precision grinding of the balls.

One of the first grindings—the sparks fly as the excess of steel is removed.

The rings, too, are ground.



This bottom row shows some of the delicate precision work in the final assembly of ball bearings. The inner and outer rings are gaged for diameter, bore, width, etc.

Finally the bearing is assembled and lubricated, and those to be sealed have shields inserted.

All pictures on this and the preceding page are courtesy of the Anti-Friction Bearing Manufacturing Association, Inc.

terminology is shown in the following actual experience of one bearing manufacturer.

It was reported to the home office by a bearing salesman that a particular customer could not complete a test run of an experimental installation because of retainer trouble. Upon receipt of this condensed report a service engineer traveled several hundred miles only to learn that the difficulty was experienced with grease retainers and not with a bearing part.

The terms "diametral clearance" or "radial clearance" have been used for many years to designate the total play or movement diametrically within a bearing. To experienced personnel, whether producer or consumer, this practice offered no difficulty; however, every new draftsman or engineer has at some time believed that radial clearance was one half of the diametral clearance.

A similar problem regarding bearing eccentricity has finally been settled in the proposed new standard terminology. For many years it was understood by the experienced bearing user that "eccentricity" was the total runout of either the inner or outer ring, and common usage, as in the case of the word "inflammable," (now replaced by "flammable" to avoid confusion) strongly resisted any change. This inaccuracy in bearing manufacture will be known from now on as "radial runout" so that even the inexperienced will have no difficulty in understanding it.

The new American Standard Tolerances for Ball and Roller Bearings fills a long-standing void. For years the bearing industry has been fairly well standardized on tolerances for ball bearings, but the manufacturers of roller bearings have retained their individuality a little longer. Such was the case with regard to heavy duty needle bearings, when up to less than ten years ago, bearings of the same nominal dimensions were actually manufactured in one case with plus tolerances, while in another case the manufacturer produced them with negative tolerances. In each case there was good reason for the difference in practice. It is a credit to any organization to change a long-standing practice, with a corresponding economic loss, for the benefit of the majority.

Through the cooperation of the Anti-Friction Bearing Manufacturers Association in the work of the American Standards Association, many bearings of the same nominal dimensions that formerly had different tolerances are now interchangeable dimensionally.

The new standard also specifies various classes of tolerances where selection of bearings is necessary for particular accuracy of fit or running characteristics. The precision of fit or running accuracy needed in a machine tool spindle is not required in a transmission counter shaft. For such reasons four classes of tolerances known as ABEC-1, ABEC-3, ABEC-5 and ABEC-7, have been established for ball bearings, while two classes known as RBEC-1 and RBEC-5, have been set up for cylindrical roller bearings. The symbols ABEC and RBEC refer to the Annular Bearing Engineers Committee (Ball Bearing) and the Roller Bearing Engineers Committee of the AFBMA, respectively. The number designation refers to the accuracy—the higher the number, the more refined is the class.

For the average ball bearing application, ABEC-1 class of tolerance is considered standard, but occasionally it is necessary to select bearings with closer accuracy with respect to one or more of the following measurements: bore, outside diameter, ring width, inner or outer ring runout, parallelism of sides, side runout, and groove parallelism with side. When such selection is necessary, this new American Standard on Tolerances, together with the new American Standard on terminology and definitions (when approved), offers the means for the specification and understanding of the same. All tolerances, however, apply only when measured in accordance with the American Standard Ball and Roller Bearing Gaging Practice, B3.4-1950.

One point of warning must be mentioned at this time: Bearings that are *dimensionally* interchangeable are not necessarily *functionally* interchangeable. This is due to differences in internal construction, such as diametral clearance, cage construction, or outside diameter (OD) of inner ring in the case of cylindrical bearings with separable races.

Here is an example of where bearings were not functionally interchangeable. A single-row ball bearing of "A" manufacture failed repeatedly in a new automotive transmission after two to three months service. A bearing of "B" manufacture was used in the third replacement and operated for the remaining four years that the owner retained the car. This was a case where it could be said the bearing of "A" manufacture was too precise for the application; the only difference between the two bearings being in the running clearance between the cage and the rolling elements.

One can readily picture an application where the flange diameter of a single-flanged separable inner ring of a cylindrical roller bearing might interfere with a particular assembly procedure; resulting in another case where similar bearings are not functionally interchangeable.

The number of such cases is fortunately very small. However, the problem will never be entirely eliminated until such time as all the bearings of any particular size are manufactured to the same blueprints.

The two new standards presented here refer to three of the eight phases of standardization listed above. These completed standards will become more useful as the other phases of the standardization job are completed; such as "Boundary Dimensions," for example.

The work of ASA Sectional Committee B3 on Ball and Roller Bearings includes all the phases of this problem with the exception of the identification and coding of antifriction bearings. This is being handled separately by ASA Sectional Committee B54. Sectional Committee B3 has also decided to cooperate actively in the work of the International Organization for Standardization—technical committee ISO/TC 3, on Ball and Roller Bearings.

What's New on American Standard Projects

Manhole Frames and Covers for Subsurface Structures, A35—

Sponsors: American Society of Civil Engineers; Telephone Group

In reply to questions as to how widely the American Standard on Manhole Frames and Covers, Z35.1-1941, is used, companies in the Bell Telephone System have reported that they use the standard wherever it applies in their operations. However, they reported, this does not mean that they use every type included in the standard. Some of the waterworks companies also use one or more of the designs given in the standard. Sidewalk openings, such as those for coal holes and sidewalk elevators, are not covered in American Standard Z35.1-1941.

National Electrical Code, C1—

Sponsor: National Fire Protection Association

The NFPA Electrical Correlating Committee, in charge of the National Electrical Code, announces that proposals for amendments to be incorporated in the 1953 edition may be filed now with the chairman of the appropriate Code-making panel, with Merwin M. Brandon, 161 Sixth Avenue, New York, chairman of the National Electrical Code Committee, or with Charles L. Smith, 612 North Michigan Avenue, Chicago, secretary of the committee. January 1, 1952 has been set as the final date for receipt of proposals for revisions in this edition. A schedule has been prepared that will permit publication of the next edition of the Code during the summer of 1953.

Rayon Fabrics, L22—

Sponsor: National Retail Dry Goods Association

Calling attention to the Proposed American Standards on Rayon Fabrics, *Stores* Magazine for May declares that store owners, merchandise managers, and buyers now have a ready tool for use in the purchase of yard goods and end products. *Stores* is published by the National Retail Dry Goods Association, which has approved the rayon standards as sponsor.

These proposed standards "are just as much measuring devices as is the yardstick used in determining the actual yardage of goods supplied," Dr Jules Labarthe, Jr, Senior Fellow, Mellon Institute, University of Pittsburgh, author of the *Stores* article, declares. "In this case, the measuring device tells the retailer and his customer that the rayon has certain strength and performance characteristics making it suitable for some end uses and not for others."

The store buyer need not be a chemist or technician to use the standards, Dr Labarthe explains. If he wants to order a line of ladies' rayon dresses intended for sports wear, for example, he need only indicate on his order blank "To be made of rayon goods conforming to proposed ASA 22.1.1" This is a designation for women's woven sportswear fabrics.

The garment manufacturer must then be sure that the goods he has bought to fill this order are likewise designated as having been tested for proposed ASA 22.1.1 and that they have fulfilled the requirements. Dr Labarthe explains. The manufacturer will then indicate on his invoice that the goods were finished and dyed in accordance with the buyer's order.

For the consumer and the laundry and dry cleaner, the standard requires a permanent sewn-in label in all garments made according to the American Standard. This will indicate how the garment is to be laundered at home or in commercial laundries, or dry cleaned.

Store owners, merchandising managers, and buyers can now start to make inquiries from their source of supply as to how many of their products contain rayon fabrics which meet the standards, the article suggests. An important point for retail buyers to check is how many of their products use linings, facings, ribbons, belts, shoulder pads, and similar components that will not cause damage to fabrics meeting the requirements of the standards.

"These standards are powerful tools," Dr Labarthe declares. "They have been widely circulated among consumer groups. Probably in your own community, your store executives, your buyers, and your sales people are going to be asked about them. Even if you are not ready to use them today or when they are finally set up with a certification plan backing, you should at least know about them and be able to explain them to your own customers."

Safety Code for Coal Mine Transportation, M15—

Sponsor: American Mining Congress

A subcommittee to investigate the possibility of developing installation standards for conveyors and mobile equipment used in transportation of coal is being organized. This work will supplement present American Standards and other standards covering rail transportation in coal mines.

A subcommittee that has been working on revision of the Safety Code for Coal Mine Transportation, M15-1931, expects to present recommendations to the sectional committee later this year.

Films, Plates, and Papers, PH1—

Sponsor: Photographic Standards (Correlating) Committee

A draft of a revised edition of the American Standard for Thickness of Photographic Papers, Z38.1.44-1944, has just been completed and will be circulated to members of PH1. The subcommittee on photographic papers is also working on a revision of the American Standards on Inch Width Rolls, Z38.1.5-1943, Centimeter Size

Sheets and Rolls, Z38.1.6-1943, and Inch Size Sheets, Z38.1.43-1947. These three previous standards are being combined into two standards—one for sheets and another for rolls.

Photographic Processing, PH4—

Sponsor: Photographic Standards (Correlating) Committee

Three proposed American Standards have been sent to letter ballot of sectional committee PH4. If approved, they will be submitted to ASA. They are:

Specifications for Photographic Trays, PH4.3

Specifications for Sheet Film Processing Tanks, PH4.2

Specifications for Photographic Hangers (Channel - Type) (Plates and Sheet Film), PH4.4

Pipe Flanges and Fittings, B16—

Sponsors: American Society of Mechanical Engineers; Heating, Piping, and Air Conditioning Contractors National Association; Manufacturers Standardization Society of the Valve and Fittings Industry

A proposed American Standard on Nonmetallic Gaskets for Pipe Flanges has just been sent to letter ballot of sectional committee B16. This standard covers the types and sizes; material; dimensions and tolerances; and formulas for determining the diameters of gaskets.

A table for the selection of the proper gasket for the desired type of flange material, pressure rating, and type of flange face is included. This table contains a reference column which lists existing American and MSS Standards giving the sizes of the various kinds of flanges covered.

Copies of this proposed standard may be obtained by writing to D. M. Shackelford, Standards Department, American Society of Mechanical Engineers, 29 West 39 Street, New York 18, N. Y.

Standards for Graphical Presentation, Z15—

Sponsor: American Society of Mechanical Engineers

As a result of the meeting of committee Z15, May 18, a single draft will be prepared of a proposed revision to American Standards on Engineering and Scientific Charts for Lantern Slides, Z15.1-1932, R1947, and Engineering and Scientific Graphs for Publications, Z15.3-1943 R1947.

As the same chart drawings are usually used for both publications and lantern slides, the committee feels that it will aid users of the standard if all the pertinent information can be obtained in one document. There are, however, several conflicting requirements between Z15.1 and Z15.3. Therefore, in publishing the new edition the general requirements will come first, with supplementary sections covering special requirements for each end usage following.

A proposed revision to the American Standard Time Series Charts, Z15.2-1938 R1947, is also being prepared.

Safety Code Correlating Committee—

At a meeting of the SCCC May 7, a program of publicity and promotion for American Safety Standards was discussed. The committee agreed that greater emphasis should be placed on such a program in order to encourage the adoption and use of the safety codes under its jurisdiction.

The committee also discussed and approved the following recommendations:

1. Reactivation of project A92 on Ladder Towers and Rolling Scaffolds.

2. Reactivation of project B8 on Protection of Workers in Foundaries, as the present foundry code is obsolete.

3. Review and revision, if necessary, of the scopes of projects Z5 on ventilation and Z9 on exhaust systems so that any gaps which exist between the two projects will be covered.

4. Review the possibility of establishing a standard on Acrylonitrile by committee Z37 on Allowable Concentration of Toxic Dusts and Gases. This committee should also consider development of new standards on butadiene, beryllium, and alkalies.

5. Consideration by Committee Z9 of the development of a standard on Metal Cleaning Sanitation.

6. Urge the sponsor for project on Dry Cleaning Operations to form a committee for the development of such a standard.

7. Invitations should be sent to various public works administrators, casualty underwriters, the American Society of Civil Engineers, the American Water Works Association and the Electric Power Industry to transmit to ASA such material as they believe would be valuable for inclusion in a code for the protection of public employees.

Motor Oil Cans

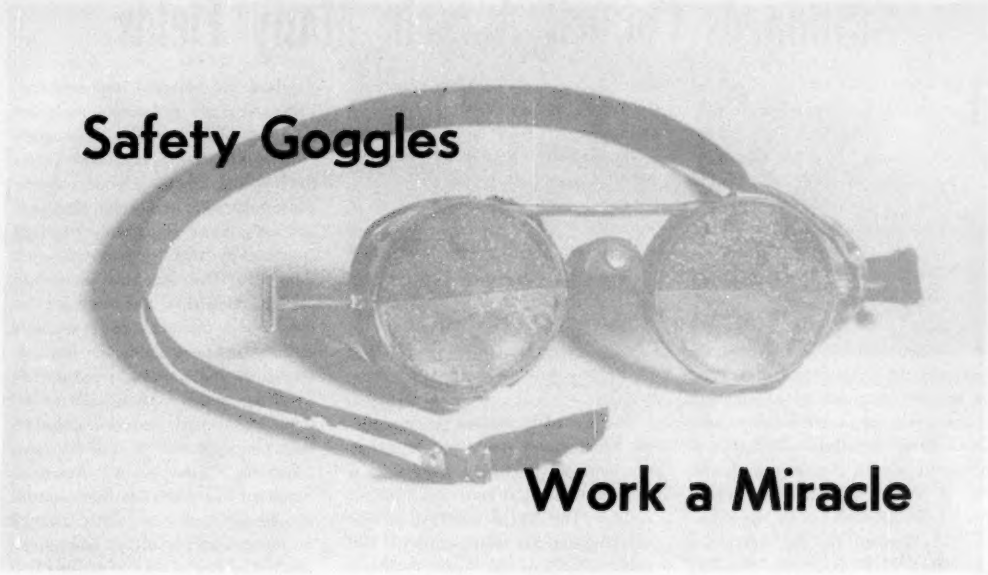
A General Conference, called together by ASA May 24, unanimously agreed that a project on standardization of the diameter and height of motor oil cans should be initiated under the procedure of the American Standards Association. It was decided that a drafting committee, consisting of the users and manufacturers of cans, should be appointed to prepare recommendations for consideration by the General Conference.

The Conference resulted from a request made by the Joint Container Committee of the American Petroleum institute and the National Lubricating Grease Institute. They asked that an American Standard be prepared for the dimensions of 1-quart and 5-quart motor oil cans. The Conference agreed that the 1-gallon size should also be considered.

The request grew out of the desire of users of motor oil cans to have interchangeable dimensions, mainly to facilitate handling the cans by filling and closing machinery.

• • **Geyer Made Director**—H. W. Geyer, chairman of the American Gas Association Requirements Subcommittee on gas water heaters from 1941 to 1949, has been made Director of the West Coast Research and Development Laboratory of the Robertshaw-Fulton Controls Company.

Safety Goggles Work a Miracle



With appreciation to the Colorado Fuel and Iron Corporation

On February 14, an explosion of white hot molten iron flew squarely into the face of Benny Fernandez, 34 year old Pueblo steelworker. The superhot metal seared through his hair and scorched down the entire length of his face in one blinding flash of pain.

The safety goggles that Benny had worn, were melted and fused by the molten iron. When they were removed, the skin around Benny's eyes was a little red. His eyes were not hurt. He could see!

Less than one month after the accident in an open hearth at the Colorado Fuel and Iron Corporation steel plant—Benny had almost recovered. A miracle? Benny says yes. His eyes were saved—he can see. His face has no scars and his hair and beard are growing back. As soon as the deep burns, still under treatment, on his neck clear up, he'll be back at his job.

The officials at the CF&I mill declare that normal safety precautions plus fast and expert medical care turned the trick. The safety goggles, standard equipment for men working with the tricky molten iron as it coughs and sputters, saved Benny's sight. The goggles were built to withstand just such an emergency. They met American Standard Specifications.

Doctors treated Benny's second and third degree burns with all the modern know-how. New skin, without scar tissue, and new hair have appeared. Benny responded so quickly that he was able to pose for photographers within a few days "to show my buddies what goggles really mean." Benny is so grateful that he welcomes any opportunity to have the photographs published to tell his miracle to the world. So far, Benny's story has been printed in *National Safety News* and *Time* magazine as well as the *Denver Post*.

NOTE: Specifications for Goggles are contained in the American Standard Safety Code for Protection of Heads, Eyes, and Respiratory Organs, Z2 1938.

Standards Council Acts in Many Fields

TWO actions related to the use of standards in defense production were important results of the May 29 meeting of ASA's Standards Council. The Council, responsible for all technical work under ASA procedure, was concerned over the possibility that requests for emergency standards might find the Association unprepared to complete standards as quickly as needed. It asked the Committee on Procedure to investigate the desirability of setting up an emergency procedure to permit speeding up committee activities and approval of standards. If the committee finds such a procedure desirable, it is to work out recommendations for consideration by the Council. The request for the emergency procedure came from the Building Code and Construction Standards Correlating Committee which foresaw possible need for it in its own work.

A number of Member-Bodies reported that they have already taken action to speed their own procedures so they can quickly make changes in standards when manufacturers find it necessary to use substitute materials.

The Council also voted in favor of negotiating contracts for two projects requested by the Bureau of Ships, U.S. Navy. One is for the development of standards for shock-testing mechanism and the other for a Bureau of Ships Standards Manual. The policy of doing the work requested through contracts has been approved by ASA's Board of Directors contingent on approval by the Council.

A ceremony recognizing the vital role of the trade association and technical society representatives on the Council was a feature of the meeting. Scrolls were presented to those members who had served for a year on the Council.

Technical activities of the past six months were reported by the Board of Review and the correlating committees.

The Board of Review is responsible for assuring that every organization with an important interest in a proposed standard has its "day in court." The Board reported that in carrying out this responsibility it had returned a Proposed American Standard Method for Detection of Photopropism to the sponsors because a negative vote by an organization primarily concerned with the use of the test method had not been given adequate consideration by the sectional committee.

Approval of a Proposed Revision of the American Standard for Electrical Equipment in Coal Mines, M2-1926, had been postponed by the Board because conflicts between the technical requirements of the proposed revision and the National Electrical Safety Code and National Electrical Code had been called to its attention. The Mining Standardization Correlating Committee, to which the standard was referred, reported that a few changes in wording are being made to resolve these differences.

"The Board of Review recognizes the National Electrical Code as being one of the most important, and possibly the most important, standard approved by ASA," it reported to the Council. "The standard is widely used by municipal and state regulatory bodies throughout the entire country and is a guide to electrical inspectors and manufacturers of electrical equipment in their daily activities. The Board further recognizes that the approval of the National Electrical Code as an American Standard has given the Code special significance and has greatly assisted in the promotion of its widespread use." The Board then explained that it has approved the 1951 edition of the Code. Under the plan of organization for the project, set up by the National Fire Protection Association as sponsor, 14 panel committees are recognized by ASA as constituting the sectional committee. The Board of Review is recommending that NFPA tighten its procedures to eliminate any question as to a consensus on provisions of the Code within these panel committees. The Board reported, however, that it "is very pleased to note that, for the first time in the history of ASA approval of the National Electrical Code, the sectional committee has been classified and balanced."

These three cases emphasize the importance of the attention paid by ASA throughout the years of its operation to the application of the consensus principle, T. E. Veltfort, chairman of the Board of Review, reported.

Since September 1950, the Board has approved 179 new standards and revisions of existing standards.

The Council authorized the American Society of Mechanical Engineers and the American Public Health Association, sponsors of the project on Plumbing, A40, to carry out a canvass to determine whether there is a consensus on the proposed new

ASA's Standards Council in Action

uniform plumbing code. This code was developed by a Coordinating Committee organized by the two sponsors, after Sectional Committee A40 was disbanded two years ago. Purpose of the Coordinating Committee was to harmonize the several plumbing codes then in existence. Represented on the committee were the American Public Health Association, American Society of Mechanical Engineers, American Society of Sanitary Engineering, Building Officials Conference of America, Conference of State Sanitary Engineers, U.S. Department of Commerce, U.S. Public Health Service, and Western Plumbing Officials Association.

In its first report to the Council since its organization last year, the Chemical Industry Correlating Committee told the Council that it has an interest in the work being done in 14 standardization projects. It is making arrangements to present the viewpoint of the chemical industry to these committees. To develop the chemical industry's viewpoint on a standard in which it is interested, the CICC appoints a subcommittee chairman from its membership. He is empowered to recruit members for his committee from the industry, subject to review by CICC. The subcommittee then develops plans and tentative solutions; presents its ideas to a conference of representatives from the chemical industry and other related industries; and then presents formal recommendations to the CICC. Four subcommittees are now operating: Stainless Steel Pipe and Fittings: Stainless Steel Analyses; Valves and Fittings for Hazardous Services; Unfired Pressure Vessels.

In addition to recommending a new schedule 5S for thin-wall stainless steel pipe, the first of these subcommittees is studying the need for thin-wall pipe fabricated from other corrosion-resistant metals. These thin-wall pipes have wide application in the chemical industry and it is expected will conserve critical materials, the committee reported.

The objectives of the other subcommittees are as follows:

Subcommittee on Stainless Steel Analyses. The allowable ranges of chromium and nickel content of standard grades of stainless steels are too broad to meet many of the requirements of the chemical industry. Consequently, the tendency has been for various companies independently to modify standard grades, thus complicating deliveries and practically eliminating any possibility of warehousing such materials. This subcommittee will attempt to correlate the stainless steel requirements, with respect to analyses, of the various companies, and to recommend the adoption of the desired additional grades, first, in ASTM Standards for the various physical forms of stainless steels, and ultimately, in appropriate American Standards.

ASA President T. D. Jolly handing service awards to Board Members Maurice Stanley, B. S. Voorhees, Ardenia Chapman, and J. G. Vincent. Lester S. Corey also received an award. Service of Standards Council members was recognized at the Council meeting (see Marginal Notes, page 202)

Subcommittee on Valves and Fittings for Hazardous Services. Valves and fittings of the so-called "ammonia-type" commonly are used in the chemical industry for services involving liquids and gases under pressure, such as ammonia, sulphur dioxide, chlorine, and others. These valves and fittings originally were developed mainly for the refrigeration industry. Designs, thicknesses, and especially flange facings and drilling templates vary from manufacturer to manufacturer. This subcommittee will attempt to develop an industry-wide viewpoint, and take appropriate steps to have developed American Standards for this class of material.

Subcommittee on Unfired Pressure Vessels. This subcommittee is concerned with the requirements of the ASME Unfired Pressure Vessel Code as it affects the chemical industry, pro and con. Due to special conditions within the industry, there are some requirements that are believed to be unduly severe; conversely, it is felt that, from a safety viewpoint, some requirements might properly be made more stringent. The subcommittee will make a thorough study, and report to the CICC. "It is planned subsequently to transmit the approved report, in the form of recommendations, to the ASME Boiler Code Committee," the CICC reported. "It is recognized that this work cannot immediately come under the jurisdiction of the ASA. The CICC, however, is ideally constituted to represent the chemical industry in such problems. Under these circumstances, failure to carry the industry's problems to the ASME doubtless would be a disservice," CICC declared.

Organizations represented on the new Drawings and Symbols Correlating Committee as approved by the Council are: American Institute of Electrical Engineers; American Institute of Physics; American Society of Civil Engineers; American Society of Mechanical Engineers; Institute of Radio Engineers; Munitions Board (liaison); National Conference of Business Paper Editors; National

(*Continued on page* 231)

AMERICAN STANDARDS

Status as of June 14, 1951

Legend

Standards Council — Approval by Standards Council is final approval as American Standard; usually requires 4 weeks

Board of Review—Acts for Standards Council, gives final approval as American Standards; usually requires 2 weeks

Correlating Committees — Approve standards to send to Standards Council or Board of Review for final action; approval by correlating committee usually takes 4 weeks

Building

American Standards Just Approved—

Method of Making and Curing Concrete Compression and Flexure Test Specimens in the Field ASTM C31-49; ASA A37.13-1951

Method of Test for Compressive Strength of Molded Concrete Cylinders ASTM C39-49; ASA A37.18-1951

Method of Test for Organic Impurities in Sands for Concrete ASTM C40-48; ASA A37.19-1951

Methods of Securing, Preparing and Testing Specimens from Hardened Concrete for Compressive and Flexural Strengths ASTM C42-49; ASA A-37.20-1951

Method of Test for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading) ASTM C78-49; ASA A37.22-1951

Method of Test for Compressive Strength of Concrete Using Portions of Beams Broken in Flexure (Modified Cube Method) ASTM C116-49; ASA A37.24-1951

Method of Test for Amount of Material Finer Than No. 200 Sieve in Aggregates ASA A37.4-1951 (ASTM C117-49; Revision of ASA A37.4-1943 R 1948)

Method of Measuring Length of Drilled Concrete Cores ASTM C174-49; ASA A37.31-1951

Method of Test for Penetration of Bituminous Materials ASTM D5-49; ASA A37.1-1951

Definition of Terms Relating to Materials for Roads and Pavements ASTM D8-49; ASA A37.33-1951

Method of Sampling Stone, Slag, Gravel, Sand and Stone for use as Highway Materials ASTM D75-48; ASA A37.75-1951

Specifications for Calcium Chloride ASTM D98-48; ASA A37.37-1951

Method of Testing Emulsified Asphalts ASTM D244-49; ASA A37.42-1951

Method of Float Test for Bituminous Materials ASTM D139-49; ASA A37.2-1951

Recommended Practice for Bituminous Mixing Plant Inspection ASTM D290-49T; ASA A37.43-1951

Methods of Sampling and Testing Calcium Chloride ASTM D345-48; ASA A37.44-1951

Specification for Asphalt Plank ASTM D517-50; ASA A37.48-1951

Method of Test for Sulfonation Index of Road Tars ASTM D872-48; ASA A37.59-1951

Specification for Emulsified Asphalt ASTM D977-49; ASA A37.55-1951

Specification for Ready-Mixed Concrete ASTM C94-48; ASA A37.69-1951

Method of Test for Air Content of Freshly Mixed Concrete by the Pressure Method ASTM C231-49T; ASA A37.70-1951

Method of Test for Specific Gravity of Road Oils, Road Tars, Asphalt Cements and Soft Tar Pitches ASTM D70-27; ASA A37.71-1951

Method of Test for Specific Gravity of Asphalts and Tar Pitches Sufficiently Solid to be Handled in Fragments ASTM D71-27; ASA A37.72-1951

Method of Test for Distillation of Cut-Back Asphaltic Products (ASTM D402-49; ASA A37.45-1951

Sponsor: American Society for Testing Materials

Building Exits Code, NFPA101; ASA A9.1-1951

Sponsor: National Fire Protection Association

In Correlating Committee—

Building Code Requirements for Reinforced Concrete (Revision of ACI 318-47; ASA A89.1-1948)

Sponsor: American Concrete Institute

American Standards Reaffirmed—

Method of Test for Toughness of Rock, A37.73-1951 (ASTM D3-18; formerly ASA A5-1930)

Specifications for Materials for Cement Grout Filler for Brick and Stone Block, A37.74-1951 Pavements (ASTM D57-29; formerly ASA A31-1924)

Requested by: American Society for Testing Materials

Chemicals

American Standard Just Published—

Methods of Chemical Analysis of Yellow, Orange, Red, and Brown Pigments Containing Iron and Manganese ASTM D50-50; ASA K44-1951 (Revision of ASTM D50-36; ASA K44-1937) $.25

Sponsor: American Society for Testing Materials

Consumer

American Standards Just Published—

Specifications for Textile Testing Machines, ASTM D 76-49; ASA L14.66-1951 $.25

Methods of Testing and Tolerances for Knit Goods; ASTM D 231-46; ASA L14.67-1951 $.25

Methods of Testing and Tolerances for Cotton Yarns, ASTM D 180-49T; ASA L14.13-1951 $.25

Methods of Testing and Tolerances for Woven Glass Fabrics, ASTM D 579-49; ASA L14.37-1951 $.25

Methods of Testing and Tolerances for Woven Glass Tapes, ASTM D 580-49; ASA L14.38-1951 $.25

Method of Test for Fiber Length of Wool, ASTM D 519-49; ASA L14.32-1951 $.25

Methods of Testing and Tolerances for Woven Glass Tubular Sleeving and Braids, ASTM D 581-49; ASA L14.39-1951 $.25

Sponsors: American Society for Testing Materials; American Association of Textile Chemists and Colorists

Electrical

American Standards Just Published—

National Electrical Code, C1-1951 $.10

Sponsor: National Fire Protection Association

Dimensional and Electrical Characteristics of 32-Watt T-10 12-Inch Circular Fluorescent Lamp, C78.413-1951 $.25

Dimensional and Electrical Characteristics of 40-Watt T-12 Instant-Start Fluorescent Lamp, C78.600-1951 $.25

Dimensional and Electrical Characteristics of 48-Inch T-12 Instant-Start Single-Pin Hot-Cathode Fluorescent Lamp, C78.808-1951 $.25

Dimensional and Electrical Characteristics of 40-Watt T-7 Instant-Start Fluorescent Lamp, C78.601-1951 $.25

Dimensional and Electrical Characteristics of 72-Inch T-12 Instant-Start Single-Pin Hot-Cathode Fluorescent Lamp, C78.809-1951 $.25

Dimensional and Electrical Characteristics of 96-Inch T-12 Instant-Start Single-Pin Hot-Cathode Fluorescent Lamp, C78.810-1951 $.25

Sponsor: Electrical Standards Committee

Power Factor and Dielectric Constant of Electrical Insulating Oils of Petroleum Origin, Method of Test (ASTM D 924-49; ASA C59.22-1951) $.25

Gas Content of Insulating Oils, Method of Test (ASTM D 831-48; ASA C59.23-1951) $.25

Inorganic Chlorides and Sulfates in Insulating Oils, Method of Test (ASTM D 878-49; ASA C59.24-1951) $.25

Natural Block Mica and Mica Films Suitable for Use in Fixed Mica-Dielectric Capacitors, Specifications for (ASTM D 748-49; ASA C59.26-1951) $.25

Detection of Free Sulfur in Electrical Insulating Oils, Method of Test (ASTM D 981-48T; ASA C59.25-1951) $.25

Method of Testing Sheet and Plate Materials Used in Electrical Insulation ASTM D 229-49; ASA C59.13-1951 (Re-

vision of ASTM D 229-46; ASA C59.13-1948) $.25
Sponsor: American Society for Testing Materials

Gas Burning Appliances

In Correlating Committee—

Approval Requirements for Central Heating Gas Appliances, Z21.13 (Revision of Z21.13-1945 and Z21.13 a and b-1950)
Approval Requirements for Gas Unit Heaters, Z21.16 (Revision of Z21.16-1940, R1947)
Listing Requirements for Automatic Pilots, Z21.30 (Revision of Z21.30-1940, R1947)
Addenda to American Standard Approval Requirements for Gas Water Heaters, Z21.10-1950, Z21.10
Sponsor: American Gas Association

Graphical Symbols

In Correlating Committee—

Graphical Symbols for Single (one) Line Electrical Engineering Diagrams, Z32.1.1
Sponsors: American Institute of Electrical Engineers; American Society of Mechanical Engineers

Mechanical

American Standards Just Published—

Steel Butt-Welding, B16.9-1951 (Revision of B16.9-1940) $.75
Malleable-Iron Screwed Fittings, 300 Lb, B16.19-1951 $.60
Sponsors: American Society of Mechanical Engineers; Manufacturers Standardization Society of the Valve and Fittings Industry; Heating, Piping, and Air Conditioning Contractors' National Association
Drill Drivers, Split-Sleeve, Collet Type, B5.27-1951 $.45
Sponsors: American Society of Mechanical Engineers; Metal Cutting Tool Institute; National Machine Tool Builders' Association; Society of Automotive Engineers
Inspection of Fine Pitch Gears, B6.11-1951 $2.50
Sponsors: American Society of Mechanical Engineers; American Gear Manufacturers Association
Specifications for Zinc Coated (Galvanized) Iron and Steel Sheets ASTM A 93-50T; ASA G8.2-1951 (Revision of ASTM A 93-48T; ASA G8.2-1949) $.25
Specifications for Brass Wire ASTM B 134-50; ASA H32.1-1951 (Revision of ASTM B 134-49; ASA H32.1-1949) $.25

Motion Picture

In Correlating Committee—

Sound Transmission of Perforated Projection Screens, PH2.82
Sponsor: Society of Motion Picture and Television Engineers

Office Equipment

American Standards Just Approved—

Size Designation for Index Cards and Record-Keeping Cards, X2.4.1-1951
Dimensions of Desks and Tables for General Office Use, X2.1.1-1951
Sponsor: National Office Management Association

Federal Interim Procurement Specifications

The following specifications, still under development, have been published by the Federal Supply Services for procurement purposes. Copies can be consulted at the Library of the American Standards Association. Comments will be welcomed by the Director, Standards Division, Federal Supply Service, General Services Administration, Washington 25, D.C.

Serial Number	*Title of Specification*
2104	Para-Phenylenediamine Dihydrochloride
2105	Potassium Dichromate, Photographic Grade
2121	Ferric Ammonium Citrate (Green); Technical Grade
2155	Fungicide, Liquid, Concentrate
2160	Titanium Dioxide, Dry; (Paint Pigment)
2161	Excelsior (Wood)
2162	Blow Gun for Air-Blast Cleaning

News Briefs

• • **U.S. Representatives in Portugal**—The United States will be well represented at the meeting of the International Electrotechnical Commission in Estoril, Portugal, July 4 to 12. Dr H. S. Osborne, chief engineer, American Telephone and Telegraph Company, president of the United States National Committee of the IEC, is heading the delegation. Other members are:

R. C. Sogge, Manager, Standards Division, Executive Department, General Electric Company, Schenectady, N.Y. (Vice-President, USNC)
Vice Admiral G. F. Hussey, Jr, USN (Ret), Managing Director, American Standards Association (Treasurer, USNC)
H. R. Arnold, Supervising Engineer, Transformer Division, Westinghouse Electric Corporation, Sharon, Penn. (Member, ASA Committee on Transformers, C57)
V. L. Cox, Manager of Engineering, Switchgear Divisions, General Electric Company, Philadelphia, Penn. (Chairman, ASA Committee on Switchgear, C37; Technical Advisor, USNC Tech Com 17 on Switchgear and Tech Com 32 on Fuses)
Professor C. L. Dawes, Harvard University, Cambridge, Mass. (Chairman, ASA Committee on Definitions of Electrical Terms, C42; Tech Advisory for USNC Tech Com 1 on IEC Vocabulary)
C. W. Falls, Manager, Commercial Engineering Division, Small and Medium Motors Division, General Electric Company, Schenectady, N.Y. (Vice-Chairman, General Engg Com, Motor and Generator Section, NEMA; Member, ASA Committee on Rotating Electrical Machinery, C50, Tech Advisor, USNC Tech Com 31 on Flame-proof Enclosures)
C. M. Laffoon, Manager, A-C Engineering Department, Westinghouse Electric Corp, East Pittsburgh, Penn; Member ASA Committee on Rotating Electrical Machinery, C50)
E. F. Seaman, Head Engineer, Standardization Planning Branch, Bureau of Ships, Department of the Navy, Washington, D.C.
C. F. Wagner, Consulting Engineer, Westinghouse Electric Corp, Pittsburgh, Penn. (Technical Advisor, USNC Tech Com 8 on Standard Voltages and Currents, and 28 on Insulation Coordination; Joint Tech Advisor for USNC Tech Com 30 on Extra-High Voltages)
W. C. Wagner, Executive Department, Philadelphia Electric Company, Philadelphia, Penn. (Chairman, Standards Council of ASA)
J. W. McNair, Electrical Engineer, American Standards Association (Secretary, USNC)

These delegates are scheduled to take part in meetings of IEC technical committees on power switchgear; insulation; electronic components; definitions; rotating electrical machinery; turbo-generators; motor dimensions; standard voltages and currents; transformers; and coordination of insulation.

• • **New Chairman on National Electrical Code**—Merwin M. Brandon, vice-president of Underwriters' Laboratories, New York, has been named chairman of the National Fire Protection Association's Electrical Correlating Committee and of the Electrical Section. These committees are responsible for the continuing revisions of the National Electrical Code. Mr Brandon succeeds Alvah Small, who has retired after having been responsible for direction of NFPA electrical affairs for many years.

Armed Forces

(*Continued from page* 213)

velopment of specifications and standards is done by people at the working levels of the departments where the technical knowledge exists. In addition, the assistance of such joint organizations as the Aeronautical Standards Group, the Quartermaster Food and Container Institute of the Armed Forces, the Armed Services Electro Standards Agency, and other joint bodies specializing in certain fields has been retained.

Because it is at the working level where contact with industry and with industrial standards associations can be most effective, the procedure provides for coordination with industry and standards associations at this level. The function of the Standards Agency is to provide for such coordination through its procedures, and only to interject itself into the picture sufficiently to insure that coordination with industry is taking place, that the two-way street of mutual benefit is kept open. Without unwarranted expansion of the personnel of the Standards Agency it could not participate in the many technical committees of the industrial associations. There is full appreciation of need for industry assistance, and it is obtained in the most expeditious manner in each particular case.

Having been given control of Military specifications and standards, the Standards Agency inherited certain other problems. One of these was qualified products lists. Operating under the same policy of decentralization, qualified products lists are developed by designated activities when required by a specification. The list itself is prepared by the designated activity and submitted to the Standards Agency for promulgation.

The Standards Agency was aware of the many complaints about the difficulty of obtaining specifications and standards or even of getting information about them. With the widespread nature of military activities, the tremendous number of items, the diversified fields of interest, the complex administrative problems involved, not to mention the constantly changing nature of the specifications and standards, it is no wonder that anyone attempting to master it ended up by considering it only a hopeless state of confusion. The Standards Agency on investigation found that it was necessary to have a list of some seventeen different indexes to be able to obtain information about specifications and standards in use by the Military Departments for procurement. To remedy this situation it has arranged for an agreement with the Military Departments for the issuance of a Military Index consisting of four volumes:

Volume I—*Munitions Board;* listing all MIL specifications and standards

Volume II—*Army;* Specifications and standards used by the Army

Volume III—*Navy;* Specifications and standards used by the Navy

Volume IV—*Air Force;* Specifications and standards used by the Air Force

Monthly supplements will be issued to keep these volumes current, with a new issue of the basic volume semi-annually. This index, with the Federal Index, should furnish any needed information about specifications and standards in use in the Department of Defense. The Military Index, or separate volumes thereof, will be available through the Superintendent of Documents. The first issue was scheduled as of 1 April 1951.[1]

There are millions of items in the supply system of the three Military Departments. Needless to say, there is not a specification for each and every one of them. There is, however, a large quantity developed throughout the years. Standardization has been given consideration in these specifications, but not the intensive treatment and attention it is now receiving. At the present time the Military Services use about 19,000 specifications. Of these 19,000 specifications, slightly less than 2,200 are Federal specifications. Including the JAN specifications developed by the Joint Army and Navy Specifications Board, about 3,900 are coordinated MIL specifications. The balance consists of unconverted departmental specifications and MIL-uncoordinated specifications. Considering the length of time the Standards Agency has been in operation, this accomplishment speaks for itself.

In addition to these specifications there have been produced 80 book form standards, 60 sheet form standards, and the necessary revisions and amendments to keep the specifications and standards in a current condition.

It must always be remembered that the actual work is done by the personnel of the Military Departments, and the agreements must be made by the Military Departments. The Standards Agency is a coordinating agency, comparatively small in size, promoting the progress of the Munitions Board Standardization Program.

[1]For announcement of Indexes available, see page 213.

Creeping Mobilization

(*Continued from page* 210)

smooth out a bit the peak that otherwise would overtake us? At any rate, regardless of whether the figures I have used are precisely accurate, this is illustrative of the type of continuing analysis and evaluation that must be made of the effect of these factors—first, upon industry as a whole, then upon your particular industry, and then upon your individual company.

I see no other means of determining intelligently what our individual courses should be, how much defense production and what type, we should seek—in short, what our program should be, both from a selfish standpoint and that of the country as well.

It is my firm conviction that if all of us put our shoulders to the wheel, constantly assume the initiative, and pull together, we shall not only attain the common objectives, but we shall find that what serves our individual company's interest will serve that of our country as well. If we succeed realistically, honestly and conscientiously in attaining our individual objectives, we will achieve that fineness of balance which I have again and again emphasized: adequate support of the military effort with simultaneous strengthening of our civilian economy—the national strength so mandatory for assurance, in these troubled times, of our preservation.

Packaging

(*Continued from page* 215)

jeep spare parts. You can establish an entirely different unit package of small jeep spares for an army transportation unit or motor pool than for a Seabee unit, where they are lucky when they get one or two jeeps assigned to them. It is for reasons of that sort that you cannot make hard and fast rules on everything from the top, but each problem must first be worked out by the cognizant bureaus, commands, or technical services.

One of the most frequently mentioned points in these discussions is whether something should be packed for domestic shipment or for overseas. The difficulty is that, in troubled times like these, it is often impossible to predict where something will ultimately end up. It seems to be terrific waste to manufacture something in Chicago, ship it to Rock Island Arsenal, and package it for overseas shipment. I can just imagine the headlines in certain newspapers about military waste and boondoggling. On the other hand, while this stock may sit on the shelves in Rock Island, another Korea, or Yugoslavia, or Indo-China or Iran may break out, and it may again be necessary to scoop up everything we have on the shelves, load it on planes, and ship it to the danger point without having a moment's time for proper preservation and packaging for overseas shipment.

The thinking in the different departments has been along the same lines, even though they have not arrived at exactly the same solution. For example, the Navy for the last couple of years has said, "If the end use is definitely known to be domestic, use domestic preservation and packaging. If the end use is definitely known to be overseas, or if the end use is *unknown* at the time of manufacture, package it for overseas."

The Air Force, on the other hand, decided that they would accept an arbitrary 50 percent for domestic and 50 percent for overseas shipment except, of course, in cases where more exact percentages of actual final destination are known.

One point where packaging and materials handling engineers do not always agree is just where the dividing line between the two arts, crafts, sciences or dogmas, whatever you may call it, can be found. For example, is a pallet a materials handling unit or is it a package? No matter what answer you come up with, we have found that it is of the utmost importance that materials handling and packaging study or advisory groups work very closely together. If you take your pallet as an example, now that a 40 x 48 pallet has been standardized for the military we at the packaging end certainly must try to design packages which fit this standard pallet wherever possible.

As chairman of the Packaging Advisory Committee of NSIA, I sit in on the meetings of the Materials Handling Advisory Committee. At their last meeting early this month they discussed the establishment of a Task Committee relating to Air Cargo to which I am now going to appoint a liaison man for packaging because it seems impossible to divorce the two subjects in a study of that type.

It is obvious that the necessity for continuous improvement in the standardization of packaging for the military has been realized increasingly both from the point of view of cost and from the point of view of efficiency. The military and those of us who are working with them on the various advisory committees will continue to try to make it more effective. We have constant meetings all over the country on this or that problem. So when you walk into a committee room in the Pentagon or at 90 Church Street in New York, or in a smoke-filled hotel room almost any place, and you find a bunch of people in deep gloom tearing each other's hair out or attempting to drown their sorrows, they might be concerned with relatively minor problems like developing the hydrogen bomb, but it is more likely that they are a bunch of packaging specialists trying to find a common denominator for a packaging specification on nuts and bolts.

Council Acts

(*Continued from page* 227)

Electrical Manufacturers Association; Society of Automotive Engineers; Telephone Group.

Projects under this committee's supervision include Letter Symbols, Y10; Graphic Presentation, Y15; Drawings and Drafting Practice, Y14; Graphical Symbols and Designations, Y32; Refrigeration Symbols and Nomenclature, Y53. Sectional Committees Y10 and Y32 are being reorganized in recognition of the fact that work on abbreviations formerly under their jurisdiction is being placed in a new committee now being organized.

The Safety Code Correlating Committee is launching an extensive program to see whether industry has safety material to send in for processing through ASA procedure for approval as American Standard. This is in line with recommendations made by the President's Conference on Industrial Safety (see page 224).

Industry may be faced with its last chance to do constructive work on industrial safety standards on a voluntary basis, the Council was warned. If statements made by labor representatives are taken seriously, labor groups are ready to carry their requests for safety standards to the Government for mandatory legislation. The Safety Code Correlating Committee has also recommended a procedure for publicizing and promoting American Safety Standards to get them more widely into use.

A new sectional committee will develop model laws and ordinances as a guide for states and local authorities to use in adopting national standards. The committee was authorized by the Council as a reorganization of the special committee that has been studying the problem for the past three years. Scope will be: "Development of model laws and ordinances including constitution provisions which through adoption would enable states and local jurisdictions (counties, municipalities, etc) to effectuate the use and proper administration of nationally recognized standards and codes and latest revisions thereof."

BALL BEARINGS... ROLLER BEARINGS

More than 250 million bearings of over 18,000 types and sizes are produced each year. For precise application of this variety of types and sizes—all needed in this machine age—the American Standard, Tolerances for Ball and Roller Bearings, has just been published.

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The standard contains 15 tables specifying tolerances for bore, outside diameter, ring width, and radial runouts of inner and outer ring; with the addition of parallelism of sides, side run-out, and groove parallelism with sides in two tables of the most highly refined tolerances.

Types of bearings covered are: annular ball; cylindrical roller (including journal); magneto; airframe; thrust ball; industrial and airframe needle; and tapered roller bearings.

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